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AUTHOR	Fine, Sara
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ABSTRACT

The second phase of a 1977 University of Pittsburgh research study that focused on the resistance to technology in libraries, this parallel study of library school students and faculty continues the investigation to determine: (1) the extent to which technological transformation of library systems will tend to encounter resistance as preprofessional students enter the profession; (2) the behavioral, attitudinal, environmental, and demographic variables that may be significantly related to resistance by students; and (3) the extent to which the library school experience is designed to enhance the adaptability of students to professional change. The study, which involves a national survey of students and faculty of accredited U.S. library programs, was developed based on a behavioral sciences model. This volume comprises the Progress Report (Part I) and the Background Papers (Part II). Part I details the interview survey, and includes copies of the student and faculty questionnaires; reprints of other written interview materials; biographical information about the interviewers and the interview coordinators; and sample contact materials. Part II is a compilation of six background works: (1) "The State of the Art of Library Education: A Personal View" (James M. Matarazzo); (2) "Education for the Librarian as an Information Scientist" (Robert M. Hayes); (3) "Some Reflections on Library Education by a Public Library Administrator" (John H. Rebenack); (4) "The Need for Future Research on Topics Impacting Library Education" (Ruth M. Katz); (5) "Education for Information Science" (Allen Kent); and (6) "A Student's Perspective on Information Science Education" (Eileen Trauth). (SD)

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SUPPLEMENTARY PROGRESS REPORT

Library Education and Resistance to Technology

Sara Fine
University of Pittsburgh

IR052841

PROJECT TITLE: Library Education and Resistance to Technology

PROJECT DIRECTOR: Sara Fine, Ph.D., School of Library and Information
Science, University of Pittsburgh 15260 (412) 624-5237

Project Dates: January 1, 1979 - June 30, 1980

ABSTRACT

Resistance to innovation is a phenomenon of human behavior that has been the focus of numerous studies in business, education and many of the professions. No such studies of resistance by librarians have been reported in the literature, even though technological innovation in libraries is an inevitability. In 1977 a study was undertaken at the University of Pittsburgh to focus on resistance to technology with a view to determining how such resistance may be lessened, thereby enhancing the potential expansion of library service to a broader range of citizens.

The purpose of this second phase is to conduct a parallel study of library school students and faculty to (1) determine the extent to which technological transformations of library systems will tend to encounter resistance as pre-professional students enter the profession; (2) determine the behavioral, attitudinal, environmental and demographic variables that may be significantly related to resistance by students; (3) assess the extent to which the library school experience is designed to lessen or promote the adaptability of students to professional change.

The study will involve a national survey of students and faculty of accredited library schools supplemented by in-depth interviews. Development of the study will be based on models from the behavioral sciences.

The implementation of the findings and recommendations could have significant impact on the pre-service and in-service training programs and ultimately on enhancing the quality of future professional service.

SUPPLEMENTARY PROGRESS REPORT

Project No. 475AH80037 Grant No. G07801808

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Institution: University of Pittsburgh

Title of Project: Library Education and Resistance to Technology

Project Director: Sara Fine

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Office of Education
Office of Libraries and Learning Resources

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PART I

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PART I

THE INTERVIEW PHASE

The Interview Phase

Methods and Procedures

The procedures for conducting the interview survey of this study are based on the theoretical background and the assumptions about the interview as a specialized device for the collection of data described in the Phase I study, Part I, Chapter IV, "The Interview Phase" (pp. 62-67). This chapter begins with the following statement:

> The interview is a powerful instrument for social research, a data collection method characterized by its directness of approach and its subjectivity of response. Herein lie both its strength and its limitations. An interview, assuming a sensitive and qualified interviewer and a willing and verbal subject, can elicit a quality of information that is unobtainable through any other kind of survey instrument. On the other hand, an interview survey is based on a number of assumptions, not the least of which are a respondent who is both willing and able to provide requested information readily and accurately, and an interviewer and an instrument both free of bias and unambiguous in language. (p. 62)

The interview phase of this study had a dual purpose: (1) to validate the data obtained from the mail survey instrument, and (2) to provide added information about the variables and research questions of this study. The interview phase provided the opportunity for on-site visits to the library schools selected for this phase of the study and, therefore, permitted the collection of qualitative data unobtainable from the mail survey.

This report of the procedures for conducting the interview phase will include descriptions of the following aspects of the process:

A. The selection of interview sites.

B. Procedures for contacting subject schools and information to be collected by this process.

C. Arrangements for selecting supervising, and training of interviewers.

D. The interview instruments.

Selection of the Interview Sites

The schools at which interviews were conducted were selected in a purposive sample based as follows:

A. A set of criteria were established that would provide for some distribution based on specified variables. There was an attempt to distribute interviews among schools that varied along geographical, size, urbanicity lines, as well as other criteria relevant to the purpose of this study. This distribution was not made systematically and was limited by other criteria for selection. Some of the criteria were subjective in that experts were asked to judge the strength of the schools' technological orientation.

B. Since the interview process was dependent on the cooperation of the school's administration, selection was also based on the perceptions of the researcher on the likelihood that responses would be given freely, that interviewers would be welcome, and that students and faculty would be encouraged to participate.

C. One major consideration was the availability of on-site interviewers and a coordinator/supervisor who could be trained by the research team.

D. Budgetary limitations on travel was a major consideration. Sites were selected with attention to other travel by the research team so that travel funds for this project would allow for the greatest diversity of sites. In several instances, sites were selected because there are two library schools, usually of diverse character, in the same city, thus allowing a single training trip to provide two interview sites.

The following variables were considered in the selection of schools:

1. Geographic location
2. Size (student population)
3. Urbanicity (size of city in which school is located)
4. Doctoral program in Library Science
5. One year or two year Master's program
6. Whether the school was included in the mail survey

These variables were the ones that could be discerned through available reference sources. There were other criteria that would have been very appropriate (for example, placement of graduates, faculty attitudes toward technology, and continuing education offerings, etc.) but these kinds of information were not available at the time the selections were made. Some of these data were collected during the course of the study and will be available to future researchers. The following table displays the distribution of interview sites by variables.

DISTRIBUTION OF INTERVIEW SITES

	STUDENT POPULATION				CITY POPULATION				GEOGRAPHIC LOCATION					PH.D. PROGRAM	LENGTH OF PROGRAM		INCLUSION IN MAIL SURVEY	
	(100 and under)	(101-150)	(151-200)	(over 200)	(under 25,000)	(25,000-99,999)	(100,000-249,000)	(250,000+)	West	Southwest	Midwest	Northeast	Southeast	Doctoral Program	One year program	Two year program	Included	Not Included
TEXAS WOMAN'S UNIVERSITY		X				X				X				X	X			X
NORTH TEXAS STATE UNIVERSITY		X				X				X				X	X			X
UNIVERSITY OF CALIFORNIA, LOS ANGELES			X					X	X					X		X		X
UNIVERSITY OF SOUTHERN CALIFORNIA				X				X	X					X	X			X
UNIVERSITY OF CHICAGO	X							X			X			X	X		X	
ROSARY COLLEGE				X	X					X					X		X	
ATLANTA UNIVERSITY	X							X					X	X	X			X
EMORY UNIVERSITY	X							X					X		X			X
UNIVERSITY OF WASHINGTON				X				X	X							X		X
GENESEO		X			X							X		X	X		X	

Selection Design for Respondents

The ten schools selected represented six general locations. At each school, the interviews were conducted: seven student interviews and three faculty interviews. Since there was no attempt to follow procedures that would produce generability, the same number of interviews were conducted at each school, thus eliminating the possibility that too few interviews would be conducted at smaller schools. Depending on the analysis of data design selected, some weighting procedures may be applied to compensate for variations in student populations relative to the number of subjects in the interview study.

The selection of students and faculty for interviewing were made by the interviewers and the school administrators in the following manner:

(1) The interviewer contacted the administrator to set a time and place for interviewing and to discuss the selection procedures.

(2) The interviewer requested a student list. The total number was divided by seven; a random number from 1 to 7 was chosen as a starting point, and every Nth person on the list was selected. These students were contacted by the interviewer to make an appointment. If the selected student was unwilling or unable to participate, the next student was called. The intervals were kept constant.

(3) For the selection of faculty to interview, the number of total faculty was divided by three and the same procedures were followed. If that faculty member was unable or unwilling to participate, the next name was selected, etc. Every effort was made to select faculty and students for interviewing without having selection made by the administrator who might be inclined to provide interviewees with a particular bias.

Pretesting the Interview Instruments

The interview schedule was pre-tested with five students in the Master's program and three faculty in the School of Library and Information Science, University of Pittsburgh. The purposes of the pre-testing procedure were to provide an estimate of the time required for interviewing, to determine the clarity or unambiguity of the questions, and to establish standardized procedures for the administration of the interview schedule. In addition, this procedure allowed the research team to establish preliminary--and tentative--coding mechanisms and a design for content analysis of the responses.

As a result of the pre-testing procedures, the experiences of the interviewers and the responses and comments of interviewees, a number of changes were made in the interview instruments. Primarily, the interview schedules were reduced in order to shorten the time required for conduct of the interviews. For some questions, the wording or directions were modified for clarity. There were several instances where unanticipated responses were given and the interview schedules were further developed to accommodate for unexpected reactions. Areas were identified where questions or response selections might be printed on cards which could be handed to respondents rather than having the questions, and all the response categories, read by the interviewer.

There were no major changes in the general, open-ended questions which closely paralleled the variables in the mail surveys. Most changes that were made related to the number and specificity of the subsets of questions or the "probe" items.

The completed questionnaires for the pre-test of the interview phase were reviewed by the research team and modified so that the final draft would reflect the experiences gained in the pilot test.

Arrangements for Selecting, Supervising, and Training Interviewers

The following procedures were applied to the interview phase:

1. A coordinator/supervisor was assigned to each interview site, either a member of the research team, a consultant who has been working on the project, or an experienced researcher who is on the site. This person was selected and oriented by the project director.
2. Interviewers were selected on-site and were trained and supervised by the coordinator/supervisor or by the project director.
3. A training manual with specific instructions for the interview procedure and for individual items was developed for use by trainers and interviewers.
4. Interviewers were responsible for following all standardized procedures and for submitting completed interviews in a form that is legible and codable.
5. Interviewers were responsible for contacting the school administrator and making logistical arrangements.

The Student Interview Questionnaire

Subject Code ________

School Code ________

Student Interview

Interviewer: ______________________________

School: ______________________________

Date: ______________________

Time Started: ____________________ Time Concluded: ____________________

First of all, I'd like to thank you for taking the time to participate in this study. As you may already know, this is a national survey of library schools to try to determine how library education is preparing students for the changes that are taking place in librarianship.

Even though we will be talking to library school deans and faculty, this study basically is about students--their attitudes, feelings and opinions about librarianship and their library school education. This is a way for students from library schools all over the country to voice their concerns.

Many of the questions I will ask you are about technology, about library schools, and about yourself. I hope you will feel free to discuss these questions with me.

[RECORD ANY COMMENTS RELATIVE TO THE ATTITUDE OF THE RESPONDENT OR SETTING, ETC. THAT MAY HAVE HAD SOME BEARING ON THE WAY THE INTERVIEWEE RESPONDED.]

[WERE THERE ANY PROBLEMS CONNECTED WITH THIS INTERVIEW?]

Did this interviewee respond to the mail survey?

Yes ☐ No ☐

1. What were the important reasons for your decision to attend this school?

[DO NOT READ OPTIONS. ALLOW RESPONDENT TO ANSWER AND CHECK RESPONSES BELOW IF GIVEN. MAKE NOTE OF ANY RESPONSE THAT IS NOT ON THIS LIST.]

☐ Money, financial considerations

☐ Reputation [PROBE: WHAT SPECIFICALLY?]

☐ Proximity to your home

☐ Recommendation from someone who attended

☐ Faculty [PROBE: WHAT SPECIFICALLY?]

☐ Other

2. How long have you been attending this school? ______________________________

3. How many technology courses have you taken? __________________________

How many of those courses were required? ____________________________

[RESPONDENT MAY DETERMINE THE MEANING OF "TECHNOLOGY" COURSES. DO NOT TRY TO INTERPRET.]

This first set of questions concerns your personal attitude toward technology in general. Please give your opinion not only as a library school student, but from your own perspective.

4. Do you believe that the future of our society depends upon advancements in technology?

☐ Yes	☐ No
[IF "YES": WOULD YOU GIVE ME SOME REASONS WHY YOU THINK IT DOES?]	[IF "NO": COULD YOU GIVE ME YOUR REACTIONS TO THE STATEMENT?]

5. Do you think technology has given us, as individuals, more or less control over our lives?

☐ More ☐ Less

[PROBE QUALIFYING REASONS: "COULD YOU EXPLAIN MORE ABOUT YOUR FEELINGS?"]

After I read each of the following statements, would you please give me your immediate reaction to it.

[QUESTIONS 6-9 REQUIRE AN IMMEDIATE REACTION. TRY TO DETERMINE DEGREE OF REACTION. RECORD RESPONDENT REACTION AND ADD COMMENTS.]

6. I am going into librarianship to work with books, not machines.

☐ Strongly Agree

☐ Agree

☐ Disagree

☐ Strongly Disagree

Respondent Comments:

7. The use of technology in libraries will become so complicated that the user will have to be specifically trained by the librarian to use it.

☐ Strongly Agree

☐ Agree

☐ Disagree

☐ Strongly Disagree

Respondent Comments:

8. Technological advancements have already dehumanized our lives.

☐ Strongly Agree

☐ Agree

☐ Disagree

☐ Strongly Disagree

Respondent Comments:

18

9. I see technology as an extension of myself that enables me to see, hear, remember and do my work more effectively.

☐ Strongly Agree

☐ Agree

☐ Disagree

☐ Strongly Disagree

Respondent Comments:

10. I am going to show you a card with some words listed on it. As you read over the list, tell me which words apply when you think of technology.

HAND RESPONDENT CARD A

[ASK RESPONDENT TO READ OFF WORDS THAT APPLY. CHECK RESPONDENT'S ANSWERS BELOW.]

___enjoyable
___dehumanizing
___degrading
___fantastic
___futuristic
___efficient
___distracting
___necessary
___expensive
___inevitable
___rigid
___uncomfortable
___flexible
___manageable
___mysterious
___simple
___exciting
___depressing
___reassuring
___limiting
___powerful
___manipulating
___alienating
___potent
___interfering
___durable
___expansive
___bland
___masculine
___feminine

[DO NOT WAIT FOR COMMENTS, GO ON TO NEXT ITEM.]

11. I am going to name 5 technologies, each of which is being used in library settings. For each technology, please indicate if your personal feelings about working with it are positive, negative or neutral.

[IF RESPONDENT HAS NOT WORKED PERSONALLY WITH THESE TECHNOLOGIES, ASK FOR A RESPONSE ANYHOW--"WELL, FROM WHAT YOU KNOW OF IT, HOW DO YOU THINK YOU WOULD FEEL IF YOU WERE TO USE IT?"] [CIRCLE RESPONSE.]

	Positive	Neutral	Negative
1. Microforms	1	2	3
2. Computer Terminals	1	2	3
3. Films and Projectors	1	2	3
4. Audio and videotape	1	2	3
5. Automated Cataloging	1	2	3

COMMENTS:

12. Has technology caused you concern that we have not discussed in any of the previous questions?

[GIVE RESPONDENT TIME TO THINK ABOUT THIS QUESTION. WHEN RESPONDENT HAS FULLY ANSWERED, PROBE ANY OF THE FOLLOWING THAT WERE NOT RAISED IN RESPONSE TO THE GENERAL QUESTION.]

PROBES: Do you think that:

a. Technology results in a loss of privacy?

b. Technological innovation in libraries may reduce the number of jobs?

c. As technology becomes more pervasive, interpersonal relationships will suffer?

d. Do you ever have a longing for "the good old days," when life was less dependent on machines and technology?

e. Technology will benefit the rich and powerful, not the common citizen.

f. Technology could mean the end for all of us. [DON'T ASK THIS DIRECTLY BUT RECORD IF RESPONDENT RAISES THIS POINT.]

Now I'd like to ask you some questions about your library school education and more about technology for libraries.

13. Did you have any work experience in libraries prior to entering school?

☐ Yes ☐ No

How long? ____________________ (to nearest year)

What type of library? ____________________ ____ __________

In what capacity? ____

14. Have you had any experience working with technology, either in or out of a library?

☐ Yes ☐ No

Could you describe your experience?

15. I am going to show you a card with some words listed on it. I am not going to ask you to describe any of these words, but would you indicate which ones you could discuss if you were asked?

HAND RESPONDENT CARD B

[CHECK RESPONDENT'S ANSWERS BELOW.]

___OCLC
___National Periodicals Center
___RLIN
___database
___microcards
___CRL
___NELINET
___NECRONET
___CLSI
___bytes
___batch
___ASIS
___nanosecond
___AMIGOS
___PNBC
___interactive system
___hologram
___laser
___CRT
___solid state
___fiber optics
___on-line
___word processing

16. Have you read any of these books or journals listed on this card?

HAND RESPONDENT CARD C

[RECORD RESPONSES.]

___On-Line Review
___Datamation
___Computer World
___None
___Journal of Library Automation
___Kent's Information Analysis and Retrieval
___Lancaster & Fayen's Information Retrieval and On-Line

Have you read any other books specifically on technology?

☐ Yes ☐ No

Could you give me some names or authors? [RECORD NAMES.]

Any journals that you read or occasionally browse? [RECORD NAMES.]

17. When you read these journals, either for your own information or for class, how do you react to the technology-related articles?

[ENCOURAGE RESPONDENT RESPONSE WHETHER HE/SHE READS THESE ARTICLES OR NOT. IF RESPONDENT GIVES RESPONSES LISTED BELOW OR SOME SIMILAR TO THOSE LISTED, CHECK THEM. RECORD OPEN-ENDED COMMENTS.]

☐ Interesting
☐ Enjoyable
☐ I understand it very well
☐ Boring
☐ Other

☐ Difficult to read
☐ Complicated
☐ Condescending to librarians
☐ Makes me feel inadequate

18. Do you think the technological aspects of librarianship are overemphasized/ underemphasized in your library school?

☐ Overemphasized ☐ Neither ☐ Underemphasized

In what way?

Do you think you aren't getting sufficient training in technology?

19. In your school do you think there is a distinction between students who are technologically oriented (or majoring in information science) and those who are library science oriented?

[THIS QUESTION MAY CAUSE THE STUDENT TO ARGUE THAT THERE IS NO DISTINCTION. RECORD THIS RESPONSE AND MOVE ON TO THE NEXT QUESTION.]

[IF RESPONDENT INDICATES STATEMENT MAY BE TRUE, PROBE AS INDICATED BELOW.]

[PROBES]

a. Do information science students (or technology-oriented students) seem to feel superior to library service students?

b. Do you think they will make more money than general librarians?

c. Is there a distinction between faculty who teach technology-related or information science courses and those who don't? If yes, could you talk a little about the differences?

20. Do you think that the faculty of this school are generally up-to-date in technological developments?

☐ Yes ☐ No

Comments:

21. Do you perceive a split in the faculty between technical people and human service people?

☐ Yes ☐ No

Comments:

These next few questions concern more about attitudes of library science students toward information scientists and technologists.

[ASK THE RESPONDENT WHETHER HE/SHE AGREES OR DISAGREES WITH THE FOLLOWING THREE STATEMENTS. TRY TO DETERMINE DEGREE OF REACTION.]

22. Technologists are machine-oriented; librarians are people oriented.

☐ Strongly Agree

☐ Agree

☐ Disagree

☐ Strongly Disagree

[ALLOW RESPONDENT TO COMMENT AND RECORD.]

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23. Agree or disagree: Professional technologists are easy to talk to, don't talk down to people, and are generally compassionate people.

☐ Strongly Agree

☐ Agree

☐ Disagree

☐ Strongly Disagree

[ALLOW RESPONDENT TO COMMENT AND RECORD.]

24. Agree or disagree: Library automation specialists rather than practicing librarians should be making the decisions about the technological needs of librarians.

☐ Strongly Agree

☐ Agree

☐ Disagree

☐ Strongly Disagree

[ALLOW RESPONDENT TO COMMENT AND RECORD.]

In this next set of questions we are trying to get a picture of how library school students view their school. We know that individual students, even in the same school at the same time, may have different responses to these questions. Would you please respond from your own point of view.

25. I am going to read several pairs of words that could be used to describe library schools. Select the word in each pair that most closely describes your school: [READ EACH PAIR AND RECORD CHOICE.]

1. a___authoritarian
   b___participatory
2. a___open
   b___closed
3. a___innovative
   b___traditional
4. a___social
   b___isolating
5. a___restrictive
   b___permissive

COMMENTS:

26a. Can you tell me anything more that would describe the environment of your school? For example, do you feel that students have a voice in library school affairs?

☐ Yes ☐ No

b. Are students free to plan their own curriculum or are there many required courses?

☐ Free ☐ Restricted

27. In general, how would you describe your general feelings about library school so far?

These, again, are perspective questions, this time about your choice of librarianship as a profession. Please respond with your attitudes and opinions, the way you view these questions.

28. Do you feel that librarianship as a profession is limited in outlook?

☐ Yes ☐ No

Any comments on your answer?

a. PROBE: Is it being accepted as a respected profession more and more as time goes on?

☐ Yes ☐ No

Comments:

29. Could you tell me how you chose librarianship as a profession?

[DO NOT READ THE OPTIONS TO THE RESPONDENT. CHECK ONE OF THE RESPONSES BELOW IF GIVEN; IF ANOTHER ANSWER IS GIVEN, CHECK "OTHER" AND LIST RESPONSE. IF MORE THAN ONE REASON IS GIVEN, ASK RESPONDENT FOR THE MOST IMPORTANT ONE.]

☐ Someone I knew or admired suggested it to me

☐ A librarian I knew influenced me

☐ It wasn't my first choice but I couldn't or thought I wouldn't get a job in what I really wanted

☐ I definitely wanted to be a librarian

☐ I happened into it without too much deliberation

☐ Other ________________________________

30. For each of the professions I name, would you tell me if you see it as being lower, equal to, or higher in status than librarianship.

[YOU SHOULD REPEAT THAT EACH PROFESSION YOU NAME IS TO BE COMPARED WITH LIBRARIANSHIP.]

	Lower	Equal	Higher
1. teacher	3	2	1
2. lawyer	3	2	1
3. nurse	3	2	1
4. small business owner	3	2	1
5. information scientist	3	2	1
6. social worker	3	2	1
7. media specialist	3	2	1
8. library school professor	3	2	1
9. psychologist	3	2	1

COMMENTS: [IF OFFERED. DO NOT PROBE.]

31. In what type of setting do you intend to work?

[DO NOT READ THE OPTIONS TO THE RESPONDENT, CHECK THE RESPONSE BELOW IF GIVEN. IF ANOTHER ANSWER IS GIVEN, CHECK "OTHER" AND LIST RESPONSE.]

___ Public library
___ Special library
___ School library
___ Academic library

___ Non-library environment. Please specify:

___ Other. Please specify:

32. What kind of position will you look for? What kind of work would you like to do?

[DO NOT READ THE OPTIONS TO THE RESPONDENT. CHECK THE RESPONSE BELOW IF GIVEN. IF ANOTHER ANSWER IS GIVEN, CHECK "OTHER" AND LIST RESPONSE.]

___Technical services
___Public services
___Administration
___Outreach or special client groups
___General (as in school library work)
___Other. Please specify: ______________________________

33. What do you consider to be an "ideal" position for a recent graduate from your school? That is, if you could pick any job upon graduation, what would it be?

[DO NOT PROBE OR SUGGEST RESPONSES.]

We would like you to answer some questions about yourself so that we can put together a profile of what today's library school students are like. Would you mind giving me your age...?

34. Age (at last birthday) ____________________

35. Sex: ☐ Male ☐ Female

36. What was your undergraduate major?

[DO NOT READ THE OPTIONS TO THE RESPONDENT, CHECK THE APPROPRIATE BOX AND ADD EXPLANATORY COMMENT ONLY IF NECESSARY.]

___ Humanities
___ Science, math or technology
___ Elementary or primary education
___ Social sciences, psychology, sociology, political science, etc.
___ Other (please specify):

37. Do you have another Master's degree?

☐ Yes ☐ No [IF "YES":] In what field? ____________________

38. Since you finished high school, in how many different places (i.e. cities, etc.) you lived, excluding your hometown)? ____________________

Have you traveled abroad? ☐ Yes ☐ No

Did you live at home (with family) when you went to college? ☐ Yes ☐ No

Could you tell me something about yourself and your personal beliefs?

39. How would you describe your lifestyle--as traditional or unconventional?

☐ Very traditional

☐ Moderately traditional

☐ In-between

☐ Somewhat unconventional

☐ Very unconventional

40a. Would you describe yourself as a religious person? ☐ Yes ☐ No

[NOTE WHETHER A "YES" RESPONSE CONCERNS]

☐ formal, traditional religion
or
☐ non-traditional

b. [PROBE: DO YOU BELIEVE THERE IS A RELATIONSHIP BETWEEN A PERSON'S RELIGIOUS BELIEFS AND THE PERSON'S FEELINGS ABOUT TECHNOLOGY?]

41. How would you describe yourself politically?

[DO NOT READ THE OPTIONS TO THE RESPONDENT. CHECK THE OPTION WHICH MOST CLOSELY MATCHES THE RESPONSE GIVEN BY THE INTERVIEWEE.]

☐ Very liberal

☐ Moderate liberal

☐ Middle of the road

☐ Inclined to be conservative

☐ Very conservative

29

One last set of items; these questions are included in this interview so that we can make some comparisons between library school students and professional librarians. I'm going to read several pairs of statements and ask you to indicate which statement in each pair is more accurate for you. You may want to say "It depends," but please try to choose one of the pair.

[RESPONDENT WILL BE FRUSTRATED AND TRY TO ARGUE FOR A COMPROMISE ON THE FOLLOWING SET. YOU MUST GET THEM TO ANSWER "a" or "b" FOR EACH PAIR.]

42.a. Becoming a success is a matter of hard work; luck has little or nothing to do with it.

b. Getting a good job depends mainly on being in the right place at the right time. a | b

43.a. Leadership positions tend to go to capable people who deserve being chosen.

b. It's hard to know why some people get leadership positions and others don't; ability doesn't seem to be the important factor. a | b

44.a. People who don't do well in life often work hard, but the breaks just don't come their way.

b. Some people just don't use the breaks that come their way. If they don't do well, it's their own fault. a | b

45.a. I have often found that what is going to happen will happen.

b. Trusting to fate has never turned out as well as making a decision to take a definite course of action. a | b

46.a. Sometimes I think human beings have gone too far in trying to control nature.

b. I believe that human beings can and should pursue all knowledge and develop all the technology that we are capable of doing. a | b

Now I have two more questions about library school before we conclude. These are both opinion questions, and we'd like to know how students perceive these issues.

47. Several library schools are moving to a two-year program.

[OR "YOUR LIBRARY SCHOOL HAS MOVED TO A TWO-YEAR PROGRAM.]

Do you think this would [OR "WILL"] help prepare students in dealing with the technological changes that are taking place in libraries?

48. One final question: How do you see the status of your Library School in relation to other professional schools in the University? How do you think the Library School ranks in status with the School of Social Work, for example, or the Law School?

Thank you very much. I wonder if you would mind giving me your opinion of this study and the subject (that is, library education and technology)?

Would you like to add any comments?

This interview?

49. The subject of this study:

50. Additional comments:

CARD A

Please tell me which words apply when you think of technology:

enjoyable
dehumanizing
degrading
fantastic
futuristic
efficient
distracting
necessary
expensive
inevitable
rigid
uncomfortable
flexible
manageable
mysterious

simple
exciting
depressing
reassuring
limiting
powerful
manipulating
alienating
potent
interfering
durable
expansive
bland
masculine
feminine

CARD B

Please indicate any of these words you could discuss:

- OCLC
- National Periodicals Center
- RLIN
- database
- microcards
- CRL
- NELINET
- NECRONET
- CLSI
- bytes
- batch
- ASIS
- nanosecond
- AMIGOS
- PNBC
- interactive system
- hologram
- laser
- CRT
- solid state
- fiber optics
- on-line
- word processing

CARD C

Please indicate any of these books or journals you have read:

On-Line Review

Datamation

Computer World

Journal of Library Automation

Kent's Information Analysis and Retrieval

Lancaster & Fayen's Information Retrieval On-Line

ITEM INSTRUCTIONS: STUDENT SURVEY

COVER SHEET:

Record any circumstances that may affect the interview, either about the school, the setting for the interview, or the respondent. Note whether the respondent has completed a mail survey questionnaire.

Item 1. Allow respondent to give answers without suggesting alternatives. If responses match those listed, check those that apply. Record only reasons that are not included in the list.

If response is "reputation," probe specifically--"What was it about the reputation of the school that attracted you?"

If response is "faculty," ask--"What did you know about the faculty or specific faculty members that attracted you to the school?"

Item 2. Record as a date (for example, Sept. 1979).

Item 3. "Technology courses" will have different meanings for different schools. Our definition will be a course that is primarily concerned with information theory or the application of technology to libraries.

After the number of courses has been reported, ask "how many of those courses are required?" If only one or two courses were taken, ask "Was that (or were those) courses required?"

The purpose is to find out whether the student elected to take the courses or whether they were required to take them.

Item 4. The appropriate "probe" question will depend on whether the response is in the positive or the negative.

Item 5. Do not try to explain what the question means. If pressed, say "whatever 'control of your life' means to you."

Items 6-9. These are questions that are to elicit feelings. Record the immediate or first reaction. Make note of any additional comments but do not probe for them.

Item 10. You may need to encourage respondent to read all the words and to give as many as they want. If you think he or she has skimmed the list too quickly, say "Are there any others?" Then go on without further comment.

Item 11. Directions are on questionnaire. Be sure to go slowly enough so that respondent can give a thoughtful response to each one in turn. You may need to say on the first few items, "Is your feeling about microforms positive, neutral or negative?" Circle the numbered response for each item.

Item 12. You will need to be very familiar with this question. It's a very important one. If responses are similar to those listed, put a check in the box, and record what they say under that item. We would like to have as many direct quotes as possible under this question.

Item 13. Check answers. Use "other" category only if you can't fit the responses into one of the usual categories. Be specific on the "other" category. Do not probe.

Item 14. We are interested in experiences that go beyond the use of electric typewriters, hand calculators, etc. Work with computers, electronics, sophisticated sound equipment, etc. would be important. If you have any doubts, record the response. Do not probe too deeply.

Item 15. You do not need to know the meanings of these items nor are you to explain them. If they need to ask, then they don't know. We just want to know which items they think they know something about.

Item 16. The respondent does not need to regularly read these journals and books. Do they sometimes read or browse through them? Try to note how intensively they have been reading.

Item 17. It is important to record the open comments made. Check the responses listed below, if applicable, but also record any comments made.

Item 18. Choose the probe according to the response given.

Item 19. This question is complicated by the fact that different schools have different structures. In some schools, there are distinct differences between library science and information science specialities. In some schools they are integrated. The question probes the way students feel about the status of librarians and information science specialists. You may need to modify it to suit your particular school.

Try to cover all three probes, regardless of the response to the main question.

Item 20. Wait for free comments. Probe only with "Can you explain your response? Any examples?"

Item 21. Wait for free comments. Probe: "Can you describe the distinction? How does it affect classroom teaching?"

Items 22-24.	Check agree or disagree. If the respondent tries to straddle the middle, urge them to give one response or the other. Then record their comments.
Item 25.	Read each pair. Wait for respondent to choose one. Ask for open comments after the pairs have been read.
Item 26.	This question is asking about student participation in school affairs. Two specific items are asked, but record any other points that are made.
Item 27.	No probes in this question. Record as many quotes as possible.
Items 28-30.	Status of librarianship questions. Record immediate reactions but also record additional comments.
Items 31-32.	Record responses. Probe if the response indicates interest in a non-library work setting: "What kind of organization would you like to work in?" or "What other kind of work would you like to do in a library?"
Item 33.	If the responses to Questions 31 and 32 are "traditional" library responses, try to get respondent to answer this question. If the question has already been answered in previous responses, go on to next question.
Items 34-35.	Check responses.
Item 36.	Only if the response does not fit the four categories, list under "other" and be specific.
Item 37.	Brief response. Do not probe.
Item 38.	The first part of the question is a number. We are trying to determine how much travel the respondent has done. Do not probe.
Item 39.	The comments are important. Do not try to interpret "traditional" and "unconventional." Let the comments the respondent makes describe what they mean by these terms.

Item 40. "Formal" religion implies church-going or traditional observance of rituals. "Non-traditional" covers any kind of self developed philosophy or spiritualism.

Ask the "probe" question whether the answer to the major question has been "yes" or "no."

Item 41. Ask the general question but do not give the categories listed. Use them to record response.

Items 42-46. Wait for response. Do not record any comments--only the choice made for each pair.

Item 47. If the school at which you are interviewing already has a two year program (UCLA, U. of Washington are the only two), ask questions using parenthetical phrases. Record all opinions, not only those related to technology.

Item 48. If respondent asks what "status" means, try to give the following kinds of vague examples: "Well, how much is the school respected by other departments?" This is a perception question; the student is not expected to "know" the answer.

Conclusion: This is really two questions.

One: How do you feel about this study? We want to know if the respondent is interested in technology and in research.

Two: Other comments. Our experience has been that this is an important part of the process. At the end of an interview, respondents will often tell you what they really think. Please record these comments carefully and include as many quotes as possible.

DEVELOPMENT OF THE INSTRUMENTS
INTERVIEW SURVEY: STUDENTS

Student Questionnaire: Outline of Variables

I. Feelings about technology in general

- A. RESIST index: Items 4 5 6 7 8 10 11
- B. Attitudes: Items 9 12 12A 12B 12C 12D 12E 12F

II. Orientation towards library technology

- A. Previous experience: Items 13 14
- B. Current awareness: Items 15 16

III. Attitude toward library school education: technology

- A. Technological course work: Item 18

IV. Attitude towards technologists

- A. Towards technologists in librarianship: Items 22 23 24
- B. Towards information science students: Item 19
- C. Towards literature in technology: Item 17

V. Perceptions about the school environment

- A. Restrictive or permissive: Item 25
- B. Student control versus institutional control: Item 26A 26B
- C. Perceptions of faculty attitude toward technology (Are there factions, technologists versus humanists): Items 20 21
- D. General attitude toward library school: Item 27

VI. Status of librarianship

- A. Status of librarianship: Items 28A 28B 30
- B. Choice of profession: Item 29
- C. Career plans: library-directed/non-library directed: Items 31 32 33

VII. Demographics

A. School-related data: Items 1 2 3

B. Age: Item 34

C. Sex: Item 35

D. Educational background (undergraduate major, other Master's degrees): Items 36 37

E. Cosmopolite: Item 38

F. Self description lifestyle

1. lifestyle: Item 39

2. political leaning: Item 41

3. religious leaning: Item 40

VIII. Personality variable

A. Locus of control: Items 42 43 44 45 46

IX. Other Variables

A. Opinions of two year program: Item 47

B. Perception of library school status: Item 48

C. Feelings about this study: Item 49

D. Additional open ended comments: Item 50

ITEM RELATIONSHIPS: INTERVIEW AND MAIL SURVEYS
STUDENT QUESTIONNAIRES

INTERVIEW ITEM	MAIL SURVEY ITEM
1	*
2	*
3	*
4	1
5	3
6	4
7	7
8	2
9	5
10	29
11	28
12a	*
12b	8
12c	9
12d	*
12e	*
12f	11
13	51a/b/c
14	51d
15	31
16	32
17	33
18	14
19a	*
19b	17
19c	*
19d	*
20	24
21	*
22	18
23	16
24	15
25	47
26a	21
26b	23
27	58
28a	27
28b	26
29	57
30	34
31	60a
32	60b
33	*
34	48
35	49
36	50
37	*
38	56
39	53
40	52
41	54
42	36
43	37
44	38
45	39
46	40
47	*
48	*
49	59
50	*

*New Item developed for Interview. Not in Mail Survey.

Subject Code ____________

SCORING NOTES

School Code ____________

Student Interview

Interviewer: ____

School: ____

Date: ______________________________

Time Started: ____________________________ Time Concluded: ________________________

First of all, I'd like to thank you for taking the time to participate in this study. As you may already know, this is a national survey of library schools to try to determine how library education is preparing students for the changes that are taking place in librarianship.

Even though we will be talking to library school deans and faculty, this study basically is about students--their attitudes, feelings and opinions about librarianship and their library school education. This is a way for students from library schools all over the country to voice their concerns.

Many of the questions I will ask you are about technology, about library schools, and about yourself. I hope you will feel free to discuss these questions with me.

[RECORD ANY COMMENTS RELATIVE TO THE ATTITUDE OF THE RESPONDENT OR SETTING, ETC. THAT MAY HAVE HAD SOME BEARING ON THE WAY THE INTERVIEWEE RESPONDED.]

[WERE THERE ANY PROBLEMS CONNECTED WITH THIS INTERVIEW?]

Did this interviewee respond to the mail survey?

Yes ☐ No ☐

Item Relationship
to Mail
Survey

1. What were the important reasons for your decision to attend this school? ⊛

[DO NOT READ OPTIONS. ALLOW RESPONDENT TO ANSWER AND CHECK RESPONSES BELOW IF GIVEN. MAKE NOTE OF ANY RESPONSE THAT IS NOT ON THIS LIST.]

☐ Money, financial considerations

☐ Reputation [PROBE: WHAT SPECIFICALLY?]

☐ Proximity to your home

☐ Recommendation from someone who attended

☐ Faculty [PROBE: WHAT SPECIFICALLY?]

☐ Other

2. How long have you been attending this school? ____________________ ⊛

3. How many technology courses have you taken? ____________________ ⊛

How many of those courses were required? ____________________ ⊛

[RESPONDENT MAY DETERMINE THE MEANING OF "TECHNOLOGY" COURSES. DO NOT TRY TO INTERPRET.]

> This first set of questions concerns your personal attitude toward technology in general. Please give your opinion not only as a library school student, but from your own perspective.

ITEMS 4-9: CHECKED RESPONSE = HIGH RESISTANCE

4. Do you believe that the future of our society depends upon advancements in technology? ①

☐ Yes ☒ No

[IF "YES": WOULD YOU GIVE ME SOME REASONS WHY YOU THINK IT DOES?]

[IF "NO": COULD YOU GIVE ME YOUR REACTIONS TO THE STATEMENT?]

5. Do you think technology has given us, as individuals, more or less control over our lives? ③ ⑥

☐ More ☒ Less

[PROBE QUALIFYING REASONS: "COULD YOU EXPLAIN MORE ABOUT YOUR FEELINGS?"]

New Item

CHECKED RESPONSES INDICATE DIRECTION OF THE ANSWERS.

After I read each of the following statements, would you please give me your immediate reaction to it.

[QUESTIONS 6-9 REQUIRE AN IMMEDIATE REACTION. TRY TO DETERMINE DEGREE OF REACTION. RECORD RESPONDENT REACTION AND ADD COMMENTS.]

6. I am going into librarianship to work with books, not machines. ④

☒ Strongly Agree

☐ Agree

☐ Disagree

☐ Strongly Disagree

Respondent Comments:

7. The use of technology in libraries will become so complicated that the user will have to be specifically trained by the librarian to use it. ⑦

☒ Strongly Agree

☐ Agree

☐ Disagree

☐ Strongly Disagree

Respondent Comments:

8. Technological advancements have already dehumanized our lives. ②

☒ Strongly Agree

☐ Agree

☐ Disagree

☐ Strongly Disagree

Respondent Comments:

9. I see technology as an extension of myself that enables me to see, hear, remember and do my work more effectively. (5)

☐ Strongly Agree

☐ Agree

☐ Disagree

☒ Strongly Disagree

Respondent Comments:

10. I am going to show you a card with some words listed on it. As you read over the list, tell me which words apply when you think of technology. (29)

HAND RESPONDENT CARD A

[ASK RESPONDENT TO READ OFF WORDS THAT APPLY. CHECK RESPONDENT'S ANSWERS BELOW.]

___enjoyable
___dehumanizing
___degrading
___fantastic
___futuristic
___efficient
___distracting
___necessary
___expensive
___inevitable

___rigid
___uncomfortable
___flexible
___manageable
___mysterious
___simple
___exciting
___depressing
___reassuring
___limiting

___powerful
___manipulating
___alienating
___potent
___interfering
___durable
___expansive
___bland
___masculine
___feminine

HIGH NUMBER OF NEGATIVES checked = HIGH RESISTANCE

[DO NOT WAIT FOR COMMENTS, GO ON TO NEXT ITEM.]

11. I am going to name 5 technologies, each of which is being used in library settings. For each technology, please indicate if your personal feelings about working with it are positive, negative or neutral. (28)

[IF RESPONDENT HAS NOT WORKED PERSONALLY WITH THESE TECHNOLOGIES, ASK FOR A RESPONSE ANYHOW--"WELL, FROM WHAT YOU KNOW OF IT, HOW DO YOU THINK YOU WOULD FEEL IF YOU WERE TO USE IT?"] [CIRCLE RESPONSE.]

	Positive	Neutral	Negative
1. Microforms	1	2	3
2. Computer Terminals	1	2	3
3. Films and Projectors	1	2	3
4. Audio and videotape	1	2	3
5. Automated Cataloging	1	2	3

HIGH SCORE = HIGH RESISTANCE

COMMENTS:

12. Has technology caused you concern that we have not discussed in any of the previous questions? (*)

[GIVE RESPONDENT TIME TO THINK ABOUT THIS QUESTION. WHEN RESPONDENT HAS FULLY ANSWERED, PROBE ANY OF THE FOLLOWING THAT WERE NOT RAISED IN RESPONSE TO THE GENERAL QUESTION.]

PROBES: Do you think that:

a. Technology results in a loss of privacy? (*)

AGREE = RESISTANCE

b. Technological innovation in libraries may reduce the number of jobs? ⑧

AGREE = RESISTANCE

c. As technology becomes more pervasive, interpersonal relationships will suffer? ⑨

AGREE = RESISTANCE

d. Do you ever have a longing for "the good old days," when life was less dependent on machines and technology? (*)

"

e. Technology will benefit the rich and powerful, not the common citizen. ⑪

"

f. Technology could mean the end for all of us. [DON'T ASK THIS DIRECTLY BUT RECORD IF RESPONDENT RAISES THIS POINT.] (*)

"

Now I'd like to ask you some questions about your library school education and more about technology for libraries.

13. Did you have any work experience in libraries prior to entering school? (51/a)

☐ Yes ☐ No

How long? ____________________ (to nearest year) (51/b)

What type of library? ____________________ ____ __________ (51c)

In what capacity? ______________________________________

14. Have you had any experience working with technology, either in or out of a library? (51d)

☐ Yes ☐ No

Could you describe your experience?

15. I am going to show you a card with some words listed on it. I am not going to ask you to describe any of these words, but would you indicate which ones you could discuss if you were asked? (31)

NUMBER checked = SCORE; HIGH NUMBER = HIGH AWARENESS

HAND RESPONDENT CARD B

[CHECK RESPONDENT'S ANSWERS BELOW.]

___OCLC
___National Periodicals Center
___RLIN
___database
___microcards
___CRL
___NELINET
___NECRONET
Score separately: if checked

___CLSI
___bytes
___batch
___ASIS
___nanosecond
___AMIGOS
___PNBC
___interactive system

___hologram
___laser
___CRT
___solid state
___fiber optics
___on-line
___word processing

16. Have you read any of these books or journals listed on this card? (32)

NUMBER checked = SCORE; HIGH SCORE = HIGH AWARENESS

HAND RESPONDENT CARD C

[RECORD RESPONSES.]

___On-Line Review
___Datamation
___Computer World
___None

___Journal of Library Automation
___Kent's Information Analysis and Retrieval
___Lancaster & Fayen's Information Retrieval and On-Line

Have you read any other books specifically on technology?

☐ Yes ☐ No

Could you give me some names or authors? [RECORD NAMES.]

Any journals that you read or occasionally browse? [RECORD NAMES.]

17. When you read these journals, either for your own information or for class, how do you react to the technology-related articles? ㉝

[ENCOURAGE RESPONDENT RESPONSE WHETHER HE/SHE READS THESE ARTICLES OR NOT. IF RESPONDENT GIVES RESPONSES LISTED BELOW OR SOME SIMILAR TO THOSE LISTED, CHECK THEM. RECORD OPEN-ENDED COMMENTS.]

DESCRIPTIVE: TECH. LITERATURE

☐ Interesting

☐ Enjoyable

☐ I understand it very well

☐ Boring

☐ Other

☐ Difficult to read

☐ Complicated

☐ Condescending to librarians

☐ Makes me feel inadequate

18. Do you think the technological aspects of librarianship are overemphasized/underemphasized in your library school? ⑭

☒ Overemphasized ☐ Neither ☐ Underemphasized

In what way?

RESISTANCE - ?

DESCRIPTIVE: SCHOOL ORIENTATION

Do you think you aren't getting sufficient training in technology?

19. In your school do you think there is a distinction between students who are technologically oriented (or majoring in information science) and those who are library science oriented? (*)

DESCRIPTIVE: SCHOOL

[THIS QUESTION MAY CAUSE THE STUDENT TO ARGUE THAT THERE IS NO DISTINCTION. SIMPLY RECORD THIS RESPONSE AND MOVE ON TO THE NEXT QUESTION.]

[IF RESPONDENT INDICATES STATEMENT MAY BE TRUE, PROBE AS INDICATED BELOW.]

[PROBES]

a. Do information science students (or technology-oriented students) seem to feel superior to library service students? ⑰

b. Do you think they will make more money than general librarians? ⊛

c. Is there a distinction between faculty who teach technology-related or information science courses and those who don't? If yes, could you talk a little about the differences? ⊛

20. Do you think that the faculty of this school are generally up-to-date in technological developments? (24)

☐ Yes ☐ No

Comments:

21. Do you perceive a split in the faculty between technical people and human service people? (*)

☐ Yes ☐ No

Comments:

These next few questions concern more about attitudes of library science students toward information scientists and technologists.

[ASK THE RESPONDENT WHETHER HE/SHE AGREES OR DISAGREES WITH THE FOLLOWING THREE STATEMENTS. TRY TO DETERMINE DEGREE OF REACTION.]

Items 22-24: Checked response = HIGH RESISTANCE TECHNOLOGISTS

22. Technologists are machine-oriented; librarians are people oriented. (18)

☒ Strongly Agree

☐ Agree

☐ Disagree

☐ Strongly Disagree

[ALLOW RESPONDENT TO COMMENT AND RECORD.]

23. Agree or disagree: Professional technologists are easy to talk to, don't talk down to people, and are generally compassionate people. (16)

☐ Strongly Agree

☐ Agree

☐ Disagree

☒ Strongly Disagree

[ALLOW RESPONDENT TO COMMENT AND RECORD.]

24. Agree or disagree: Library automation specialists rather than practicing librarians should be making the decisions about the technological needs of librarians. (15)

☐ Strongly Agree

☐ Agree

☐ Disagree

☒ Strongly Disagree

[ALLOW RESPONDENT TO COMMENT AND RECORD.]

> In this next set of questions we are trying to get a picture of how library school students view their school. We know that individual students, even in the same school at the same time, may have different responses to these questions. Would you please respond from your own point of view.

25. I am going to read several pairs of words that could be used to describe library schools. Select the word in each pair that most closely describes your school: [READ EACH PAIR AND RECORD CHOICE.] (47)

1. a___ authoritarian
   b_✓_ participatory
2. a_✓_ open
   b___ closed
3. a_✓_ innovative
   b___ traditional
4. a_✓_ social
   b___ isolating
5. a___ restrictive
   b_✓_ permissive

COMMENTS:

CIRCLED RESPONSE = OPEN CLIMATE

26a. Can you tell me anything more that would describe the environment of your school? For example; do you feel that students have a voice in library school affairs? 21

☐ Yes ☐ No

b. Are students free to plan their own curriculum or are there many required courses? 23

☐ Free ☐ Restricted

27. In general, how would you describe your general feelings about library school so far? 58

These, again, are perspective questions, this time about your choice of librarianship as a profession. Please respond with your attitudes and opinions, the way you view these questions.

28. Do you feel that librarianship as a profession is limited in outlook? 27

☐ Yes ☐ No

Any comments on your answer?

a. PROBE: Is it being accepted as a respected profession more and more as time goes on? 26

☐ Yes ☐ No

Comments:

29. Could you tell me how you chose librarianship as a profession?

57

[DO NOT READ THE OPTIONS TO THE RESPONDENT. CHECK ONE OF THE RESPONSES BELOW IF GIVEN; IF ANOTHER ANSWER IS GIVEN, CHECK "OTHER" AND LIST RESPONSE. IF MORE THAN ONE REASON IS GIVEN, ASK RESPONDENT FOR THE MOST IMPORTANT ONE.]

Value
4 ☐ Someone I knew or admired suggested it to me
3 ☐ A librarian I knew influenced me
1 ☐ It wasn't my first choice but I couldn't or thought I wouldn't get a job in what I really wanted
5 ☐ I definitely wanted to be a librarian
2 ☐ I happened into it without too much deliberation
☐ Other ______________________________

5 = positive attitude librarianship

30. For each of the professions I name, would you tell me if you see it as being lower, equal to, or higher in status than librarianship.

34

[YOU SHOULD REPEAT THAT EACH PROFESSION YOU NAME IS TO BE COMPARED WITH LIBRARIANSHIP.]

	Lower	Equal	Higher
1. teacher	3	2	1
2. lawyer	3	2	1
3. nurse	3	2	1
4. small business owner	3	2	1
5. information scientist	3	2	1
6. social worker	3	2	1
7. media specialist	3	2	1
8. library school professor	3	2	1
9. psychologist	3	2	1

SUM SCORES — LOW SCORE = HIGH STATUS FOR LIBRARIANSHIP (REVERSE OF MAIL SURVEY)

COMMENTS: [IF OFFERED. DO NOT PROBE.]

31. In what type of setting do you intend to work?

60 a

[DO NOT READ THE OPTIONS TO THE RESPONDENT, CHECK THE RESPONSE BELOW IF GIVEN. IF ANOTHER ANSWER IS GIVEN, CHECK "OTHER" AND LIST RESPONSE.]

___ Public library
___ Special library
___ School library
___ Academic library

___ Non-library environment. Please specify:

NOTE THIS ITEM IN PARTICULAR

___ Other. Please specify:

32. What kind of position will you look for? What kind of work would you like to do? (60b)

[DO NOT READ THE OPTIONS TO THE RESPONDENT. CHECK THE RESPONSE BELOW IF GIVEN. IF ANOTHER ANSWER IS GIVEN, CHECK "OTHER" AND LIST RESPONSE.]

___ Technical services
___ Public services
___ Administration
___ Outreach or special client groups
___ General (as in school library work)
___ Other. Please specify: ______________________

33. What do you consider to be an "ideal" position for a recent graduate from your school? That is, if you could pick any job upon graduation, what would it be? (*)

[DO NOT PROBE OR SUGGEST RESPONSES.]

We would like you to answer some questions about yourself so that we can put together a profile of what today's library school students are like. Would you mind giving me your age...?

34. Age (at last birthday) ______________________ (48)

35. Sex: ☐ Male ☐ Female (49)

36. What was your undergraduate major? (50)

[DO NOT READ THE OPTIONS TO THE RESPONDENT, CHECK THE APPROPRIATE BOX AND ADD EXPLANATORY COMMENT ONLY IF NECESSARY.]

___ Humanities
___ Science, math or technology
___ Elementary or primary education
___ Social sciences, psychology, sociology, political science, etc.
___ Other (please specify):

37. Do you have another Master's degree? (*)

☐ Yes ☐ No [IF "YES":] In what field? ______________________

38. Since you finished high school, in how many different places (i.e. cities, etc.) have you lived, excluding your hometown)? NUMBER (56)

SCORE = NUMBER IN BLANK PLUS checked responses

Have you traveled abroad? ☑ Yes ☐ No

Did you live at home (with family) when you went to college? ☐ Yes ☑ No

Could you tell me something about yourself and your personal beliefs?

39. How would you describe your lifestyle--as traditional or unconventional? (53)

- ☐ Very traditional
- ☐ Moderately traditional
- ☐ In-between
- ☐ Somewhat unconventional
- ☐ Very unconventional

40 a. Would you describe yourself as a religious person? ☐ Yes ☐ No (52)

[NOTE WHETHER A "YES" RESPONSE CONCERNS]

☐ formal, traditional religion
or
☐ non-traditional

b. [PROBE: DO YOU BELIEVE THERE IS A RELATIONSHIP BETWEEN A PERSON'S RELIGIOUS BELIEFS AND THE PERSON'S FEELINGS ABOUT TECHNOLOGY?] (*)

41. How would you describe yourself politically?

[DO NOT READ THE OPTIONS TO THE RESPONDENT. CHECK THE OPTION WHICH MOST CLOSELY MATCHES THE RESPONSE GIVEN BY THE INTERVIEWEE.] (54)

- ☐ Very liberal
- ☐ Moderate liberal
- ☐ Middle of the road
- ☐ Inclined to be conservative
- ☐ Very conservative

One last set of items; these questions are included in this interview so that we can make some comparisons between library school students and professional librarians. I'm going to read several pairs of statements and ask you to indicate which statement in each pair is more accurate for you. You may want to say "It depends," but please try to choose one of the pair.

[RESPONDENT WILL BE FRUSTRATED AND TRY TO ARGUE FOR A COMPROMISE ON THE FOLLOWING SET. YOU MUST GET THEM TO ANSWER "a" or "b" FOR EACH PAIR.]

42.a. Becoming a success is a matter of hard work; luck has little or nothing to do with it. (36)

CONTROL 1

b. Getting a good job depends mainly on being in the right place at the right time. [✓ a] b

43.a. Leadership positions tend to go to capable people who deserve being chosen. (37)

CONTROL 2

b. It's hard to know why some people get leadership positions and others don't; ability doesn't seem to be the important factor. [✓ a] b

44.a. People who don't do well in life often work hard, but the breaks just don't come their way. (38)

CONTROL 3

b. Some people just don't use the breaks that come their way. If they don't do well, it's their own fault. a [✓ b]

45.a. I have often found that what is going to happen will happen. (39)

CONTROL 4

b. Trusting to fate has never turned out as well as making a decision to take a definite course of action. a [✓ b]

46.a. Sometimes I think human beings have gone too far in trying to control nature. (43)

CONTROL 5

b. I believe that human beings can and should pursue all knowledge and develop all the technology that we are capable of doing. a [✓ b]

ITEMS 42-46: CIRCLED RESPONSE = HIGH INNER CONTROL

Now I have two more questions about library school before we conclude. These are both opinion questions, and we'd like to know how students perceive these issues.

47. Several library schools are moving to a two-year program. (*)

[OR "YOUR LIBRARY SCHOOL HAS MOVED TO A TWO-YEAR PROGRAM.]

Do you think this would [OR "WILL"] help prepare students in dealing with the technological changes that are taking place in libraries?

48. One final question: How do you see the status of your Library School in relation to other professional schools in the University? How do you think the Library School ranks in status with the School of Social Work, for example, or the Law School? ⊛

Thank you very much. I wonder if you would mind giving me your opinion of this study and the subject (that is, library education and technology)?

Would you like to add any comments?

This interview?

49. The subject of this study: (59)

50. Additional comments: ⊛

The Faculty Interview Questionnaire

SCHOOL CODE ______

______

FACULTY INTERVIEW

Interviewer: ____________________ ______

School: ____________________

Date: ______________

Time Started: ______ ____________ **Time Concluded:** ______________

[INTERVIEWER: RECORD ANY COMMENTS RELATIVE TO THE ATTITUDE OF THE RESPONDENT THAT MAY HAVE HAD SOME BEARING ON THE WAY HE OR SHE RESPONDED:]

Additional comments (Please note any problems with the interview):

Did this interviewee respond to the mail survey?

Yes ☐ **No** ☐

FACULTY INTERVIEW

Introduction: First of all, I'd like to thank you for your participation in this study. As you may already know, this is part of a national research study, funded by the U.S. Office of Education, to assess some of the current attitudes and practices in library education related to the technological changes that are taking place in librarianship.

There are several things that I'd like to tell you about this study before we begin. First of all, this is primarily a study of students, their attitudes and perceptions about librarianship, technology, and library education. The reason we are also interviewing faculty is because we want to compare student and faculty attitudes with each other. Some of the questions I will ask you are identical with those that have been asked of students. But some of them aren't. Some of them will be about you, your particular library school, and your perceptions about librarianship and technology.

First of all, I'd like to ask you some questions about yourself.

1. How long have you taught in this school? ____________years

   [INCLUDE ALL EXPERIENCES, PARTTIME OR ADJUNCT TEACHING, ETC. GIVE ANSWER TO THE NEAREST YEAR.]

2. Did you teach in any other library schools before coming here?

   Yes ☐ No ☐

   If yes, for how many years? _______________years

3. Have you ever worked in a library?

   Yes ☐ No ☐

   If yes, for how many years did you work in libraries? [ANSWER TO NEAREST YEAR, OR "LESS THAN A YEAR."]

   _______________years

   If yes, what was the last year you worked in a library? _______________

4. Do you teach technology-related courses?

   [IS THIS THE RESPONDENT'S PRIMARY AREA OF TEACHING COMPETENCE?]

   Yes ☐ No ☐

   [RECORD COMMENTS OR EXPLANATION IF OFFERED:]

If yes, could you give me the subject areas?

[TITLES OF THE COURSES IF THEY EXPLAIN THE SUBJECT AREA.]

PROBE: "How would you describe your own degree of expertise in information science?"

[DO NOT READ THE RESPONSES BELOW. USE THEM TO RECORD RESPONDENT'S ANSWER.]

☐ An expert in the area
☐ Knowing more than most library school faculty
☐ Average amount of knowledge
☐ Less than I should know
☐ Totally uninterested in the subject

Comments:

This next set of questions concerns your personal attitudes toward technology in general. As I explained before, we are asking faculty and students many of the same questions to see if their attitudes and perceptions are the same. Please give your opinion on these questions not only as a library educator, but from your own personal perspective.

5. Do you agree that the future of our society depends on the advancement of technology?

☐ Agree Strongly
☐ Agree Somewhat
☐ Disagree Somewhat
☐ Disagree Strongly

[IF RESPONDENT COMMENTS, RECORD THEM. DO NOT PROBE.]

6. Do you agree or disagree that technology has given us as individuals more or less control over our lives? ☐ More ☐ Less

[ASK "STRONGLY AGREE," "AGREE SOMEWHAT," "TEND TO DISAGREE," OR "STRONGLY DISAGREE?"]

☐ Agree Strongly

☐ Agree Somewhat

☐ Disagree Somewhat

☐ Disagree Strongly

PROBE: In what way?

I'm going to read you some statements. Would you first give me your immediate reaction to it, and then give me any thoughts you might have about it.

7. How do you react to this statement: "I went into librarianship to work with books, not machines."

☐ Agree Strongly

☐ Agree Somewhat

☐ Disagree Somewhat

☐ Disagree Strongly

Note comments:

8. Do you agree with this statement: "The use of technology in libraries will become so complicated that the user will have to be specifically trained by the librarian to use it?"

☐ Agree Strongly

☐ Agree Somewhat

☐ Disagree Somewhat

☐ Disagree Strongly

Comments:

9. Do you agree that "Technological advancements have already dehumanized our lives?

☐ Agree Strongly

☐ Agree Somewhat

☐ Disagree Somewhat

☐ Disagree Strongly

Comments:

10. What is your personal reaction to this statement: "I see technology as an extension of myself that enables me to see and hear better and to work more effectively?"

☐ Very true for me

☐ I somewhat agree

☐ I can't agree completely

☐ Not true for me

Comments:

11. I am going to show you a card with some words listed on it. As you read over the list, tell me which words apply when you think of technology:

HAND RESPONDENT CARD A

[ENCOURAGE RESPONDENT TO CONSIDER EVERY WORD. CHECK OFF ALL THE WORDS BELOW AS THE RESPONDENT LISTS THEM.]

___enjoyable
___dehumanizing
___degrading
___fantastic
___futuristic
___efficient
___distracting
___necessary
___expensive
___inevitable

___rigid
___uncomfortable
___flexible
___manageable
___mysterious
___simple
___exciting
___depressing
___reassuring
___limiting

___powerful
___manipulating
___alienating
___potent
___interfering
___durable
___expansive
___bland
___masculine
___feminine

[DO NOT WAIT FOR COMMENTS. GO ON TO NEXT QUESTION.]

12. I am going to name five library technologies. For each technology I name, please tell me if your personal feelings about working with it are positive, negative or neutral.

[IF RESPONDENT HAS NOT WORKED PERSONALLY WITH THESE TECHNOLOGIES, ASK FOR A RESPONSE ANYHOW--"WELL, FROM WHAT YOU KNOW ABOUT IT, HOW DO YOU THINK YOU WOULD FEEL IF YOU WERE TO USE IT?"]

[READ EACH ITEM AND ASK IF RESPONDENT FEELS POSITIVE, NEUTRAL OR NEGATIVE. CIRCLE RESPONSE FOR EACH ITEM BELOW.]

	Positive	Neutral	Negative
1. Microforms	1	2	3
2. Computer Terminals	1	2	3
3. Films and Projectors	1	2	3
4. Audio and videotape	1	2	3
5. Automated Cataloging	1	2	3

Comments: [ALLOW TIME FOR OPEN COMMENTS ABOUT THESE OR ANY OTHER LIBRARY TECHNOLOGIES IF OFFERED.]

13. Has technology caused you any concerns that I have not asked about in previous questions?

[GIVE RESPONDENT TIME TO THINK ABOUT THIS QUESTION. RECORD COMMENTS BELOW. IF THE RESPONDENT SUGGESTS CONCERNS THAT ARE LISTED AS PROBES, RECORD COMMENTS UNDER THE PROBE.]

[WHEN RESPONDENT HAS FULLY ANSWERED, PROBE ANY OF THE FOLLOWING ISSUES THAT WERE NOT RAISED IN RESPONSE TO THE GENERAL QUESTION.]

PROBE a. That technology may result in a lack of privacy.

PROBE b. That technological innovations in libraries may reduce the number of jobs.

PROBE c. That as technology becomes more pervasive, interpersonal relationships will suffer.

PROBE d. That technology has complicated rather than simplified our lives, that we have become dependent on machines that don't always work.

PROBE e. That technology has and will endanger our civilization.

PROBE f. That technology benefits the elite, not the ordinary person.

PROBE g. That technology is being forced on us by technologists, administrators, etc., whether we want it or not.

14. I am going to show you a card with some words listed on it. I am not going to ask you to describe any of these terms, but would you indicate which ones you could discuss if you were asked.

HAND RESPONDENT CARD B

[RECORD RESPONSES BELOW.]

___OCLC
___National Periodicals Center
___RLIN
___database
___microcards
___CRL
___NELINET
___NECRONET

___CLSI
___bytes
___batch
___ASIS
___nanosecond
___AMIGOS
___PNBC
___interactive system

___hologram
___laser
___CRT
___solid state
___fiber optics
___on-line
___word processing

[DO NOT PROBE. GO ON TO NEXT ITEM.]

These next questions are an attempt to understand how library school faculty are adapting to technological changes that are taking place in librarianship. Would you answer these questions as they apply to yourself and your own teaching.

15. Do you teach non-technology related courses?

Yes ☐ No ☐

If yes, do you discuss technological applications as part of your course content?

[DO NOT READ RESPONSE CATEGORIES.]

Yes ☐ Sometimes ☐

No ☐ If applicable ☐

Comments:

16. Have your course materials or teaching methods changed in the past several years to reflect changes that are taking place in library technology?

Yes ☐ No ☐

If yes, could you describe what kinds of changes have taken place?

17. In what ways do you keep up with technological change?

[ALLOW FOR OPEN COMMENTS. CHECK RESPONSES BELOW IF RESPONDENT GIVES THEM.]

___research activities
___conference attendance
___journal reading
___continuing education activities
___ALA or other association sessions on technology
___none of the above
___Other ______________________________

18. Do you regularly read or browse any technology-related journals?

[IF NO, CHECK NONE BELOW. DO NOT READ NAMES OF JOURNALS.]

___Datamation
___Computer World
___Journal of Library Automation
___On-Line
___On-Line Review
___None

List any other technological journals:

19. Whether you regularly read it or not, what are your reactions to the technological literature for librarianship? Do you find it interesting, boring, difficult or easy, relevant or irrelevant, etc.?

[ALLOW OPEN COMMENTS. CHECK RESPONSES BELOW IF GIVEN; RECORD ANY QUOTATIONS HERE:]

☐ interesting
☐ boring
☐ difficult
☐ easy
☐ enjoyable
☐ complicated
☐ condescending to librarians
☐ pompous
☐ makes me feel inadequate
☐ I understand it well

20. Are you involved in conducting any "continuing education" activities that are technology related?

☐ Yes ☐ No

If yes, please give topic areas:

Research activities related to technology?

☐ Yes ☐ No

If yes, please give subject:

Do you write technology related books or articles?

☐ Yes ☐ No

If yes, could you give some examples:

21. Do you know how to run a computer search? Asking your graduate assistant doesn't count!

☐ Yes ☐ No ☐ yes, but with some difficulty

22. Do you belong to ASIS?

☐ Yes ☐ No

23.a. Do you think that faculty of this school as a whole keep up-to-date with technological developments as they occur?

☐ Yes ☐ No

Comments:

b. PROBE: Do you think your students are being trained to work in organizations other than libraries?

☐ Yes ☐ No

Comments:

One of the areas that this study is concerned with is the relationship between library science and information science. That's why we are asking for your reactions to the following questions. I'm going to read you some statements and ask you whether you agree with them or not. Then I will ask if you would like to comment on them.

24. Do you agree or disagree: "Technologists are machine-oriented; librarians are people-oriented?"

☐ Strongly Agree ☐ Agree Somewhat ☐ Tend to disagree ☐ Disagree Strongly

PROBE: Do you have some opinions about technologists or information scientists?

25. Agree or disagree: "Information technology specialists, rather than librarians, should be making the decisions about the technological needs of libraries?"

☐ Strongly Agree ☐ Agree Somewhat ☐ Tend to disagree ☐ Disagree Strongly

Comments:

These next questions concern the climate in your own library school. We would like to have your perceptions about some of these areas that we believe may be affecting attitudes.

26.a. Do you think that, in general, the faculty of this school tends to stress technological matters or human services in librarianship?

☐ technological matters ☐ human services ☐ both, fairly equal

Comments:

b. PROBE: Do you think the technological aspects of librarianship are overemphasized or underemphasized in this school?

☐ overemphasized ☐ underemphasized ☐ neither

Comments:

c. PROBE: Do you think the faculty tends to be split between the technology oriented people and the "humanists?"

☐ Yes ☐ No

If yes, could you describe how this operates?

d. PROBE: Do you think information science oriented faculty tends to feel superior to other library science faculty?

☐ Yes ☐ No

Comments:

e. Does the "system" (the school, the university, etc.) reward information science activities over library science activities?

☐ Yes ☐ No

If yes, how is this manifested?

f. How about students. Do you think information science students (or students majoring in technological areas) tend to feel superior to library service oriented students?

☐ Yes ☐ No

Comments:

27.a. Do you feel that librarianship as a profession is limited in outlook?

☐ Strongly Agree ☐ Agree Somewhat ☐ Tend to disagree ☐ Strongly Disagree

Comments?

b. PROBE: Is librarianship being accepted as a respected profession more and more as time goes on?

☐ Strongly Agree ☐ Agree Somewhat ☐ Tend to disagree ☐ Strongly Disagree

Comments?

28. I am going to read a list of professions. For each one, would you tell me if you see the profession as lower, equal, or higher in status than librarianship?

[RECORD RESPONSES BELOW.]

	Lower	Equal	Higher
1. teacher	3	2	1
2. lawyer	3	2	1
3. nurse	3	2	1
4. small business owner	3	2	1
5. information scientist	3	2	1
6. social worker	3	2	1
7. media specialist	3	2	1
8. library school professor	3	2	1
9. psychologist	3	2	1

In this next set of questions, we are trying to get a picture of how library school faculty view the library school as an organizational system. We know that individual members of a faculty, even in the same school, may have different responses to the same questions. Would you please respond from your own point of view.

29.a. I am going to read five pairs of words. Would you pick one word from each pair that most closely describes your library school?

[CHECK ONE RESPONSE, "a" or "b," FROM EACH PAIR AS RESPONDENT REPORTS.]

1a___authoritarian
b___participatory

2a___open
b___closed

3a___innovative
b___traditional

4a___social
b___isolating

5a___restrictive
b___permissive

b. PROBE: Can you tell me anything more that would help to describe the climate of your school?

30.a. How would you describe the status of the library school in relation to the University? For example, does it have a higher, lower or equal status, with the School of Social Work or the Business School?

b. PROBE: How did you determine your answer? What do you see as representing status in the University?

c. **PROBE:** How does the status of the library school affect what happens internally in the school?

d. **PROBE:** Do you have any thoughts about why the library school is held in ("high" or "low," depending on previous responses) status in the University?

31. Would you like to be the dean of a library school?

☐ Yes ☐ No ☐ Can't decide

32. Do you consider yourself to be an "opinion leader" on your faculty?

☐ Yes ☐ No ☐ Sometimes

Just a few more questions about yourself so that we can put together a profile of today's library school faculty. Would you mind giving me your age...?

33. Age:

34. Sex: ☐ Male ☐ Female

35. What graduate degrees do you have? [check all reported:]

☐ MLS ☐ Other Master's Degree [specify area ______________________]

☐ Ph.D. in Librarianship

☐ Other doctorate [Specify ______________________________]

36. What was your undergraduate major?

[CHECK BELOW AND ADD EXPLANATORY COMMENTS IF NECESSARY.]

- ☐ Humanities (English, history, etc.)
- ☐ Science, Math or Technology
- ☐ Elementary or Primary Education
- ☐ Secondary Education

  List primary subject area ____________________

- ☐ Social Sciences: psychology, sociology, political science, anthropology, political science
- ☐ The Arts: Music, Drama, Painting
- ☐ Other: Please specify

37. I have two more questions to ask you. First of all, do you think students are different than they were five years ago?

Yes ☐ No ☐

If yes, in what ways?

[WAIT FOR OPEN COMMENTS. IF YOU NEED TO PROBE, USE SUGGESTIONS BELOW.]

More or less committed to librarianship?
Higher quality?
More or less ambitious?
Looking to go into non-library environments?
More comfortable with technology?

[IF THE ISSUE OF "COMFORT WITH TECHNOLOGY" IS NOT RAISED, ASK DIRECTLY:]

PROBE: Do you think students today are more comfortable with technology than they were five years ago?

38. Several schools are moving to a two year program [or "YOUR SCHOOL HAS MOVED TO A TWO YEAR PROGRAM."] Do you think that this would [or "WILL"] help students prepare for dealing with the technological changes that are taking place in libraries?

Thank you very much. I wonder if you would like to add any additional information or comments that might be useful for this study.

39. Additional comments:

CARD A

Please tell me which words apply when you think of technology:

enjoyable
dehumanizing
degrading
fantastic
futuristic
efficient
distracting
necessary
expensive
inevitable
rigid
uncomfortable
flexible
manageable
mysterious

simple
exciting
depressing
reassuring
limiting
powerful
manipulating
alienating
potent
interfering
durable
expansive
bland
masculine
feminine

CARD B

Please indicate any of these words you could discuss:

OCLC
National Periodicals Center
RLIN
database
microcards
CRL
NELINET
NECRONET
CLSI
bytes
batch
ASIS

nanosecond
AMIGOS
PNBC
interactive system
hologram
laser
CRT
solid state
fiber optics
on-line
word processing

ITEM INSTRUCTIONS: FACULTY SURVEY

COVER PAGE:

Note any problems that may affect the interview, either about the school and the setting or about the attitude of the respondent. Note whether respondent has completed a mail survey questionnaire.

Item 2. Question calls for total number of years of teaching in library schools.

Item 4. We are looking for whether the respondent's primary teaching area is in technology courses.

Probe: The selection of responses is for the interviewer's convenience in reading. Do not read the response options, but you can mark them if the respondent gives them.

Item 5. Ask the respondent to give you the degree of agreement. Ask "Would you say that you "strongly agree," "agree somewhat," "tend to disagree," or "strongly disagree." It is important that the response fit one of the four categories. Explanatory comments can then be recorded.

Item 6. Same as Item 5.

Items 7-10. Ask the respondent to give you an answer that you can record in one of the four categories of responses: "Would you say that you "strongly agree," "agree somewhat," "tend to disagree," or "disagree strongly." Then allow for open comments to explain, clarify or add to the response and record remarks.

Item 13. After the open comments, check to see if the issues listed under Probes a-g have been discussed. If they have been mentioned by the respondent, put the comments under the probe to which they refer. If the probe issues have not been raised, ask respondent probe questions in the following style:

"One of the questions that sometimes concerns people is whether technology will reduce jobs for librarians. Is this a concern for you?"

or

"Do you think that technology will invade our personal privacy as it becomes more sophisticated?"

Do this with any issue that is not raised by the respondent.

These questions must be handled carefully since there is a negative bias implied. Be sure that respondent feels free to give a positive view of these issues. Do not try to probe for a negative position. Try to record so that positive, negative and mixed attitudes are indicated.

Item 15. The categories (yes, no, sometimes, if applicable) are there for you to use in recording responses. Do not read them aloud to respondent.

Item 17. Do not read response categories. Check off responses as they are given.

Item 18. Do not read names of journals. They are there so that you can record responses more easily.

Item 19. The words listed are for your notation. Please be sure to record any comments made that are not reflected in the choices listed.

Item 21. Do not read response categories. Let respondent tell you.

Item 22: Pronounced Ā'sis.

Item 23. The response may not be a definite "yes" or "no" in either the main question or the probe question. Record "yes" if the general tone is affirmative and "no" if the tone is negative. Record any comments.

Items 24-25. Here again ask respondents to indicate degree.

Item 26 (a-d). These are complicated for the respondent and the response categories are only there to help you record. Do not read response categories.

Item 30. We are assuming that every university has a school of social work or business. If the respondent tells you that the university doesn't have one or both of these departments, substitute School of Education or Dental School, etc. It doesn't matter what examples you use as long as they are professional schools.

Probe: Ask the question in a form that reflects the respondent's previous answers.

Item 37. Of particular interest is the probe concerning student comfort with technology.

Item 38. If school already has a two year program, use phrases in parentheses. (Two year programs are at UCLA and U. of Washington). Record all comments, not only those concerned with preparation for technology.

Item 39. This is an important part of the process. Please record final comments carefully.

DEVELOPMENT OF THE INSTRUMENTS
INTERVIEW SURVEY: FACULTY

Faculty Survey: Outline of Variables

I. Feelings about technology

  A. RESIST INDEX: Items 5 6 7 8 9 11 12

  B. Attitudes: Items 10 13 13A 13B 13C 13D 13E 13F 13G

II. Individual orientation: education for technology

  A. Individual's current status re teaching for technology (areas of teaching competence): Items 4 15 16

  B. Current awareness and updating: Items 14 17 18 21 22

  C. Research and continuing education: Item 20

  D. Perceptions of institution's attitude toward technology

    - faculty dichotomized?: Items 26C 26D

    - faculty orientation to technology?: Items 23A 26A 26B

    - school support for technological updating?: Item 26E

    - opinions about two year program in re technology: Item 38

  E. Attitudes toward technologists: Items 19 24 25 26F

  F. Perception of current students: Items 23B 37

IV. Perception of status of the school

  A. Permissive or restrictive: Items 29A 29B

  B. Relative to university organization: Item 30

V. Demographics

  A. Age: Item 33

  B. Sex: Item 34

  C. Educational background: Items 35 36

  D. Experience in libraries: Item 3

  E. Cosmopolite/academic experience: Items 1 2

VI. Personal factors

  A. Opinion leadership: Items 31 32

  B. Status of librarianship (perception): Items 27/A 27/B 28

VII. Additional comments: Item 39

ITEM RELATIONSHIPS: INTERVIEW AND MAIL SURVEYS
FACULTY QUESTIONNAIRES

INTERVIEW ITEM	MAIL SURVEY ITEM
1	36a
2	36b
3	35a/35b
4	24
5	1
6	3/6
7	4
8	7
9	2
10	5
11	22
12	21
13	*
13a	*
13b	8
13c	9
13d	*
13e	*
13f	11
13g	*
14	31
15	25
16	26
17	28
18	29
19	*
20	*
21	30
22	27
23a	17
23b	*
24	16
25	13
26a	*
26b	*
26c	*
26d	*
26e	*
26f	15
27a	20
27b	19
28	41
29a	37
29b	*
30	Institutional Survey
31	39
32	38
33	32

*New item developed for interview.

INTERVIEW ITEM	MAIL SURVEY ITEM
34	33
35	*
36	34
37	*
38	*
39	*

SCHOOL CODE ________

____

SCORING NOTES

FACULTY INTERVIEW

Interviewer: ________________________________

School: ________________________________

Date: ____________________

Time Started: ____ ______________ Time Concluded: ________________

[INTERVIEWER: RECORD ANY COMMENTS RELATIVE TO THE ATTITUDE OF THE RESPONDENT THAT MAY HAVE HAD SOME BEARING ON THE WAY HE OR SHE RESPONDED:]

Additional comments (Please note any problems with the interview):

Did this interviewee respond to the mail survey?

Yes ☐ No ☐

Item Relationship: Mail Survey

FACULTY INTERVIEW

Introduction: First of all, I'd like to thank you for your participation in this study. As you may already know, this is part of a national research study, funded by the U.S. Office of Education, to assess some of the current attitudes and practices in library education related to the technological changes that are taking place in librarianship.

There are several things that I'd like to tell you about this study before we begin. First of all, this is primarily a study of students, their attitudes and perceptions about librarianship, technology, and library education. The reason we are also interviewing faculty is because we want to compare student and faculty attitudes with each other. Some of the questions I will ask you are identical with those that have been asked of students. But some of them aren't. Some of them will be about you, your particular library school, and your perceptions about librarianship and technology.

First of all, I'd like to ask you some questions about yourself.

1. How long have you taught in this school? ____________ years (36a)

   [INCLUDE ALL EXPERIENCES, PARTTIME OR ADJUNCT TEACHING, ETC. GIVE ANSWER TO THE NEAREST YEAR.]

2. Did you teach in any other library schools before coming here? (36b)

   Yes ☐ No ☐

   If yes, for how many years? ______________ years

3. Have you ever worked in a library? (35a)

   Yes ☐ No ☐

   If yes, for how many years did you work in libraries? [ANSWER TO NEAREST YEAR, OR "LESS THAN A YEAR."]

   ______________ years

   If yes, what was the last year you worked in a library? ______________ (35b)

4. Do you teach technology-related courses? (24)

   [IS THIS THE RESPONDENT'S PRIMARY AREA OF TEACHING COMPETENCE?]

   Yes ☐ No ☐

   [RECORD COMMENTS OR EXPLANATION IF OFFERED:]

If yes, could you give me the subject areas?

[TITLES OF THE COURSES IF THEY EXPLAIN THE SUBJECT AREA.]

PROBE: "How would you describe your own degree of expertise in information science?" (*)

[DO NOT READ THE RESPONSES BELOW. USE THEM TO RECORD RESPONDENT'S ANSWER.]

☐ An expert in the area
☐ Knowing more than most library school faculty
☐ Average amount of knowledge
☐ Less than I should know
☐ Totally uninterested in the subject

Comments:

> This next set of questions concerns your personal attitudes toward technology in general. As I explained before, we are asking faculty and students many of the same questions to see if their attitudes and perceptions are the same. Please give your opinion on these questions not only as a library educator, but from your own personal perspective.

Items 5 - 10 : checked responses = HIGH RESISTANCE

5. Do you agree that the future of our society depends on the advancement of technology? ①

☐ Agree Strongly
☐ Agree Somewhat
☐ Disagree Somewhat
☒ Disagree Strongly

[IF RESPONDENT COMMENTS, RECORD THEM. DO NOT PROBE.]

NOTE: INDICATED RESPONSES REPRESENT DIRECTION OF THE ANSWERS.

6. Do you agree or disagree that technology has given us as individuals more ~~or~~ OR less ~~less~~ control over our lives? ☐ MORE ☐ LESS ③ ⑥

[ASK "STRONGLY AGREE," "AGREE SOMEWHAT," "TEND TO DISAGREE," OR "STRONGLY DISAGREE?"]

☐ Agree Strongly

☐ Agree Somewhat

☐ Disagree Somewhat

☒ Disagree Strongly

PROBE: In what way?

I'm going to read you some statements. Would you first give me your immediate reaction to it, and then give me any thoughts you might have about it.

7. How do you react to this statement: "I went into librarianship to work with books, not machines." ④

☒ Agree Strongly

☐ Agree Somewhat

☐ Disagree Somewhat

☐ Disagree Strongly

Note comments:

8. Do you agree with this statement: "The use of technology in libraries will become so complicated that the user will have to be specifically trained by the librarian to use it?" ⑦

☒ Agree Strongly

☐ Agree Somewhat

☐ Disagree Somewhat

☐ Disagree Strongly

Comments:

9. Do you agree that "Technological advancements have already dehumanized our lives?" ②

☒ Agree Strongly

☐ Agree Somewhat

☐ Disagree Somewhat

☐ Disagree Strongly

Comments:

10. What is your personal reaction to this statement: "I see technology as an extension of myself that enables me to see and hear better and to work more effectively?" ⑤

☐ Very true for me

☐ I somewhat agree

☐ I can't agree completely

☒ Not true for me

Comments:

11. I am going to show you a card with some words listed on it. As you read over the list, tell me which words apply when you think of technology: ㉒

HAND RESPONDENT CARD A

[ENCOURAGE RESPONDENT TO CONSIDER EVERY WORD. CHECK OFF ALL THE WORDS BELOW AS THE RESPONDENT LISTS THEM.]

___enjoyable
___dehumanizing
___degrading
___fantastic
___futuristic
___efficient
___distracting
___necessary
___expensive
___inevitable

___rigid
___uncomfortable
___flexible
___manageable
___mysterious
___simple
___exciting
___depressing
___reassuring
___limiting

___powerful
___manipulating
___alienating
___potent
___interfering
___durable
___expansive
___bland
___masculine
___feminine

HIGH NUMBER OF NEGATIVES Checked -
HIGH RESISTANCE

[DO NOT WAIT FOR COMMENTS. GO ON TO NEXT QUESTION.]

12. I am going to name five library technologies. For each technology I name, please tell me if your personal feelings about working with it are positive, negative or neutral. ㉑

[IF RESPONDENT HAS NOT WORKED PERSONALLY WITH THESE TECHNOLOGIES, ASK FOR A RESPONSE ANYHOW--"WELL, FROM WHAT YOU KNOW ABOUT IT, HOW DO YOU THINK YOU WOULD FEEL IF YOU WERE TO USE IT?"]

[READ EACH ITEM AND ASK IF RESPONDENT FEELS POSITIVE, NEUTRAL OR NEGATIVE. CIRCLE RESPONSE FOR EACH ITEM BELOW.]

	Positive	Neutral	Negative
1. Microforms	1	2	3
2. Computer Terminals	1	2	3
3. Films and Projectors	1	2	3
4. Audio and videotape	1	2	3
5. Automated Cataloging	1	2	3

HIGH SCORE = HIGH RESISTANCE

Comments: [ALLOW TIME FOR OPEN COMMENTS ABOUT THESE OR ANY OTHER LIBRARY TECHNOLOGIES IF OFFERED.]

13. Has technology caused you any concerns that I have not asked about in previous questions? (*)

[GIVE RESPONDENT TIME TO THINK ABOUT THIS QUESTION. RECORD COMMENTS BELOW. IF THE RESPONDENT SUGGESTS CONCERNS THAT ARE LISTED AS PROBES, RECORD COMMENTS UNDER THE PROBE.]

[WHEN RESPONDENT HAS FULLY ANSWERED, PROBE ANY OF THE FOLLOWING ISSUES THAT WERE NOT RAISED IN RESPONSE TO THE GENERAL QUESTION.]

PROBE a. That technology may result in a lack of privacy. (*)

PROBE b. That technological innovations in libraries may reduce the number of jobs. ⑧

PROBE c. That as technology becomes more pervasive, interpersonal relationships will suffer. ⑨

PROBE d. That technology has complicated rather than simplified our lives, that we have become dependent on machines that don't always work. ⊛

PROBE e. That technology has and will endanger our civilization. ⊛

PROBE f. That technology benefits the elite, not the ordinary person. ⑪

PROBE g. That technology is being forced on us by technologists, administrators, etc., whether we want it or not. ⊛

13a - 13g: Agreement indicates Resistance

14. I am going to show you a card with some words listed on it. I am not going to ask you to describe any of these terms, but would you indicate which ones you could discuss if you were asked. (31)

HAND RESPONDENT CARD B

[RECORD RESPONSES BELOW.]

___ OCLC
___ National Periodicals Center
___ RLIN
___ database
___ microcards
___ CRL
___ NELINET
___ NECRONET

score separately if checked

___ CLSI
___ bytes
___ batch
___ ASIS
___ nanosecond
___ AMIGOS
___ PNBC
___ interactive system

___ hologram
___ laser
___ CRT
___ solid state
___ fiber optics
___ on-line
___ word processing

NUMBER checked = SCORE; HIGH SCORE = HIGH AWARENESS

[DO NOT PROBE. GO ON TO NEXT ITEM.]

These next questions are an attempt to understand how library school faculty are adapting to technological changes that are taking place in librarianship. Would you answer these questions as they apply to yourself and your own teaching.

15. Do you teach non-technology related courses? (25)

Yes ☐ No ☐

If yes, do you discuss technological applications as part of your course content?

[DO NOT READ RESPONSE CATEGORIES.]

Yes ☐ Sometimes ☐
No ☐ If applicable ☐

Comments:

16. Have your course materials or teaching methods changed in the past several years to reflect changes that are taking place in library technology? (26)

Yes ☐ No ☐

If yes, could you describe what kinds of changes have taken place?

17. In what ways do you keep up with technological change? ㉘

[ALLOW FOR OPEN COMMENTS. CHECK RESPONSES BELOW IF RESPONDENT GIVES THEM.]

___research activities
___conference attendance
___journal reading
___continuing education activities
___ALA or other association sessions on technology
___none of the above
___Other ____

18. Do you regularly read or browse any technology-related journals? ㉙

[IF NO, CHECK NONE BELOW. DO NOT READ NAMES OF JOURNALS.]

___Datamation
___Computer World
___Journal of Library Automation
___On-Line
___On-Line Review
___None

List any other technological journals:

SCORE = NUMBER checked; HIGH SCORE = HIGH AWARENESS

19. Whether you regularly read it or not, what are your reactions to the technological literature for librarianship? Do you find it interesting, boring, difficult or easy, relevant or irrelevant, etc.? (*)

[ALLOW OPEN COMMENTS. CHECK RESPONSES BELOW IF GIVEN; RECORD ANY QUOTATIONS HERE:]

☐ interesting
☐ boring
☐ difficult
☐ easy
☐ enjoyable
☐ complicated
☐ condescending to librarians
☐ pompous
☐ makes me feel inadequate
☐ I understand it well

20. Are you involved in conducting any "continuing education" activities that are technology related? (*)

☐ Yes ☐ No

If yes, please give topic areas:

Research activities related to technology?

☐ Yes ☐ No

If yes, please give subject:

Do you write technology related books or articles?

☐ Yes ☐ No

If yes, could you give some examples:

21. Do you know how to run a computer search? Asking your graduate assistant doesn't count! ㉚

☐ Yes ☐ No ☐ yes, but with some difficulty

22. Do you belong to ASIS? ㉗

☐ Yes ☐ No

Items 20-21: ORIENTATION TO TECHNOLOGY

FORM Scale?

23.a. Do you think that faculty of this school as a whole keep up-to-date with technological developments as they occur? (17)

☐ Yes ☐ No

Comments:

b. PROBE: Do you think your students are being trained to work in organizations other than libraries? (*)

☐ Yes ☐ No

Comments:

One of the areas that this study is concerned with is the relationship between library science and information science. That's why we are asking for your reactions to the following questions. I'm going to read you some statements and ask you whether you agree with them or not. Then I will ask if you would like to comment on them.

Items 24-25: checked response = HIGH RESIST TECHNOLOGISTS

24. Do you agree or disagree: "Technologists are machine-oriented; librarians are people-oriented?" (16)

☒ Strongly Agree ☐ Agree Somewhat ☐ Tend to disagree ☐ Disagree Strongly

PROBE: Do you have some opinions about technologists or information scientists?

25. Agree or disagree: "Information technology specialists, rather than librarians, should be making the decisions about the technological needs of libraries?" (13)

☐ Strongly Agree ☐ Agree Somewhat ☐ Tend to disagree ☒ Disagree Strongly

Comments:

These next questions concern the climate in your own library school. We would like to have your perceptions about some of these areas that we believe may be affecting attitudes.

26.a. Do you think that, in general, the faculty of this school tends to stress technological matters or human services in librarianship? ⊛

☐ technological matters ☐ human services ☐ both, fairly equal

Comments:

b. PROBE: Do you think the technological aspects of librarianship are overemphasized or underemphasized in this school? ⊛

☐ overemphasized ☐ underemphasized ☐ neither

Comments:

DESCRIPTIVE:
SCHOOL
ORIENTATION

c. PROBE: Do you think the faculty tends to be split between the technology oriented people and the "humanists?" ⊛

☐ Yes ☐ No

If yes, could you describe how this operates?

d. PROBE: Do you think information science oriented faculty tends to feel superior to other library science faculty? ⊛

☐ Yes ☐ No

Comments:

e. Does the "system" (the school, the university, etc.) reward information science activities over library science activities? (*)

☐ Yes ☐ No

If yes, how is this manifested?

f. How about students. Do you think information science students (or students majoring in technological areas) tend to feel superior to library service oriented students? (*)

☐ Yes ☐ No

Comments:

Items 27a/27b: checked response = high esteem

27.a. Do you feel that librarianship as a profession is limited in outlook? ⑳

☐ Strongly Agree ☐ Agree Somewhat ☐ Tend to disagree ☒ Strongly Disagree

Comments?

b. PROBE: Is librarianship being accepted as a respected profession more and more as time goes on? ⑲

☒ Strongly Agree ☐ Agree Somewhat ☐ Tend to disagree ☐ Strongly Disagree

Comments?

28. I am going to read a list of professions. For each one, would you tell me if you see the profession as lower, equal, or higher in status than librarianship? (41)

[RECORD RESPONSES BELOW.]

	Lower	Equal	Higher
1. teacher	3	2	1
2. lawyer	3	2	1
3. nurse	3	2	1
4. small business owner	3	2	1
5. information scientist	3	2	1
6. social worker	3	2	1
7. media specialist	3	2	1
8. library school professor	3	2	1
9. psychologist	3	2	1

SUM SCORES
LOW SCORE = HIGH STATUS FOR LIBRARIANSHIP
(REVERSE OF MAIL SURVEY)

In this next set of questions, we are trying to get a picture of how library school faculty view the library school as an organizational system. We know that individual members of a faculty, even in the same school, may have different responses to the same questions. Would you please respond from your own point of view.

29.a. I am going to read five pairs of words. Would you pick one word from each pair that most closely describes your library school? (37)

[CHECK ONE RESPONSE, "a" or "b," FROM EACH PAIR AS RESPONDENT REPORTS.]

1a ___ authoritarian
b ✓ participatory

2a ✓ open
b ___ closed

3a ✓ innovative
b ___ traditional

4a ✓ social
b ___ isolating

5a ___ restrictive
b ✓ permissive

CIRCLED RESPONSE = OPEN CLIMATE

b. PROBE: Can you tell me anything more that would help to describe the climate of your school? (*)

30.a. How would you describe the status of the library school in relation to the University? For example, does it have a higher, lower or equal status, with the School of Social Work or the Business School? (*)

b. PROBE: How did you determine your answer? What do you see as representing status in the University?

c. PROBE: How does the status of the library school affect what happens internally in the school? (*)

d. PROBE: Do you have any thoughts about why the library school is held in ("high" or "low," depending on previous responses) status in the University?

31. Would you like to be the dean of a library school? (39)

☐ Yes ☐ No ☐ Can't decide

32. Do you consider yourself to be an "opinion leader" on your faculty? (38)

☐ Yes ☐ No ☐ Sometimes

Just a few more questions about yourself so that we can put together a profile of today's library school faculty. Would you mind giving me your age...?

33. Age: (32)

34. Sex: ☐ Male ☐ Female (33)

35. What graduate degrees do you have? [check all reported:] (*)

☐ MLS ☐ Other Master's Degree [specify area ______________________]

☐ Ph.D. in Librarianship

☐ Other doctorate [Specify ______________________]

36. What was your undergraduate major? 34

[CHECK BELOW AND ADD EXPLANATORY COMMENTS IF NECESSARY.]

☐ Humanities (English, history, etc.)

☐ Science, Math or Technology

☐ Elementary or Primary Education

☐ Secondary Education

List primary subject area ______________________________________

☐ Social Sciences: psychology, sociology, political science, anthropology, political science

☐ The Arts: Music, Drama, Painting

☐ Other: Please specify

37. I have two more questions to ask you. First of all, do you think students are different than they were five years ago? *

Yes ☐ No ☐

If yes, in what ways?

[WAIT FOR OPEN COMMENTS. IF YOU NEED TO PROBE, USE SUGGESTIONS BELOW.]

More or less committed to librarianship?
Higher quality?
More or less ambitious?
Looking to go into non-library environments?
More comfortable with technology?

[IF THE ISSUE OF "COMFORT WITH TECHNOLOGY" IS NOT RAISED, ASK DIRECTLY:]

PROBE: Do you think students today are more comfortable with technology than they were five years ago?

38. Several schools are moving to a two year program [or "YOUR SCHOOL HAS MOVED TO A TWO YEAR PROGRAM."] Do you think that this would [or "WILL"] help students prepare for dealing with the technological changes that are taking place in libraries? ⊛

Thank you very much. I wonder if you would like to add any additional information or comments that might be useful for this study.

39. Additional comments: ⊛

Interview Instructions

MANUAL OF GENERAL INSTRUCTIONS

for the

Student and Faculty Interviews

GENERAL INSTRUCTIONS

1. Introduce yourself, spend a few minutes establishing a comfortable relationship in which the respondent:

   - feels free to talk to you and answer questions frankly
   - is assured that responses will be confidential
   - understands that this is an opportunity for students and faculty across the country to voice mutual concerns

2. It is essential that respondents feel that there is no right or wrong answer. Please be careful that you do not reveal your own biases about the questions. Special care must be taken during "probes." A respondent may feel, for example, challenged to defend himself or herself when you ask for an explanation or an opinion.

3. You may need to repeat that we do not expect respondents to "know" the correct answer. We are trying to assess attitudes and beliefs, not facts and realities. You may need to emphasize, "In your opinion" or to prod a respondent with "What do you think?" or "How do you feel about it" or "How do you see it" if there is reluctance to respond with a definite answer.

4. Encourage respondents to make general comments to open ended questions, unless otherwise specified. Do not "probe" until after respondent comments on open ended question. If the respondent refers to one of the "probe areas," record response under that probe. This will enable us to score comparable responses.

5. On some items you are instructed that this is an "immediate reaction question." These are "feelings" questions and the respondent should be urged to give "gut reactions" rather than thoughtful responses. Any comments should be made after the initial reaction has been given and recorded.

6. A "probe" can be (1) a way to encourage respondent to continue (in which case it does not have a letter in front of it) or (2) it can be a secondary question to which a response is requested. You may need to indicate that the respondent has given an answer (in which case there will be a letter in front of it; for example, Item 12 has a number of lettered probes. Please be sure that you note the issues that the respondent feels are important).

7. You may find that the respondent begins to answer one question and leads into a question that is asked later on. It is best not to interrupt or delay the respondent. Take notes on the comments and transfer after the interview so that it is recorded with the appropriate question.

8. If you need more room for recording a response, you can use the blank back of the previous page of the questionnaire. You will probably need to rewrite the responses on a fresh questionnaire after the interview has been concluded. At this time please make sure that all responses are recorded legibly and that responses are recorded under the appropriate question or probe.

9. If you are uncertain that you have accurately recorded a response or if the respondent is not answering clearly, it is a good idea to read back an answer to the respondent and ask if you have recorded his or her response accurately. This is also a good device for "slowing down" the interviewee if the responses are coming too fast for you to record.

10. Sections that are boxed indicate that these are directions you are to read to the respondent about an item or a set of items. Sections in squared parentheses and capitalized [ ] are directions for you and are not to be read.

11. On several questions there is a card that you can hand to the interviewee from which he or she can give responses. The response choices are on your interview questionnaire and you can record the responses as they are given.

12. It is essential that you "know" the questionnaire so that your probe questions will come naturally and so that you can give directions without reading them.

13. Do not give more information than necessary about the study. But if pressed, the information below can be provided in response to questions. It is important to answer frankly but briefly to questions about the study.

14. Information that may be given to respondents:

    A. This is a national study of library education and attitudes toward technology and librarianship.

    B. It is funded by the U.S. Office of Education and is being conducted by the University of Pittsburgh, School of Library and Information Science. Research director is Dr. Sara Fine. Interview director is Dr. Sue Stacey.

    C. Students and faculty in 32 library schools will be contacted by a mail survey. Interviews will be conducted in ten library schools. In a few instances, the same students will be contacted both by mail and for an interview.

    D. Faculty and students will be asked many of the same questions so that we can compare responses.

E. Some of the questions may not seem relevant. We are trying to find out as much as we can about the atmosphere in the school and the attitudes of students and faculty.

F. Results: We will let them know where they can get the results if they will write to Dr. Sara Fine, 606 LIS Building, School of Library and Information Science, University of Pittsburgh, Pittsburgh, PA 15260. Results will be available through the Office of Education and through publication in the library literature.

15. It may be helpful for you to rehearse with a friend.

MANUAL

General Instructions for Interviewers

1. You will receive the following materials:

   A. Student interview questionnaires (BLUE). You will need 7 questionnaires for each school but there will be extras included.

   B. Faculty interview questionnaires (YELLOW). There will be 3 faculty interviews at each school; extras will be included.

   C. Instruction manuals for both the Student (BLUE COVER) and Faculty questionnaires (YELLOW COVER) which will provide any additional information about particular questions as well as a General Instructions Manual about how to approach the interview (WHITE).

   D. School profile forms (GREEN). Please get the information requested on this form for each school at which you are conducting interviews. This form will give us the information that we will use to describe the schools and to develop the school profile. You can probably get the answers from the person you contact at the school to set up the interviews.

   E. Contract form that indicates the terms of our agreement with you and, if applicable, states the maximum allowances for travel. Please review, sign and return promptly so that we can pay you for your work as soon as the interviews are completed. [WHITE]

   Following is a list of items that I need from you now:

   1. Contract letter, signed. Be sure to include social security number.

   2. A one-paragraph vita, particularly noting your educational status, relevant work experience, and any other items that indicate your qualifications for this project.

   As soon as interviews are completed I will need:

   3. Completed interviews with front sheet filled in.

   4. School profile for each school.

   5. All bills and expense vouchers connected with travel.

   Please note that questionnaires must be complete and legible before payment can be made.

   All completed interviews and forms must be sent to me by May 10, 1980. Payment cannot be made for anything received after that date.

2. Procedures:

   A. You will need to contact the school administration to solicit their participation. Every school has received a letter about the study from Dean Thomas Galvin of the University of Pittsburgh. Half of the schools were in the mail survey and were asked to distribute mail questionnaires to students and faculty, as well as to answer a School Survey. The other half received a letter and the School survey only. Your school may be in either group, but all deans should know something about the study. Attached is a copy of the letter that was sent, for your information.

B. You will need the following from the schools:

- A place to conduct interviews or a suggestion on where you might go. (It is probably preferable to meet students away from the immediate setting of the library school--if this is practical. Faculty will probably want to meet with you in their offices).
- A list of students and faculty. (The way you will select interviewees is included under Sampling.)
- Some suggestion on how you can best contact students and faculty to set up appointments.
- Information for the School Profile form.

C. Interviewers will set up appointments with 7 students and 3 faculty at each school. Interview sessions will take approximately one hour.

Please make notes during sessions on the questionnaire. If your writing is not very legible or if your notes are incomplete, you will need to transcribe them to a blank questionnaire after the interview is over.

D. Selection of interviewees

Please note that subjects for this study:

STUDENTS

- must be in the Masters program.
- may be full or parttime students (preferably some of each).

FACULTY

- may be full time, parttime or adjunct.
- must teach at least some courses in the Masters program.

E. Sampling

The procedure for selecting students for interviewing are as follows. Get a list of students (Masters program only, full and parttime) from the school. The organization of the list does not matter--you just need a list. Count the number of names on the list and divide by 7. This will give you "n." Start with the 4th name on the list and from there, every nth person will be asked for an interview.

For Students:

From a list of full time and parttime students, Masters program only, the names for interviews will be selected in the following way:

STEP 1. Count the total number of names on the list and divide by 7. This will give you "n" (the number in the intervals between selections).

Example:

SCHOOL X has 97 full and parttime Masters students.

$$\frac{97}{7} = 14$$

$$n = 14$$

STEP 2. Starting with the 4th name on the list, pick every nth name. (The selection of 4 as a starting point was an arbitrary decision).

Example: (In this example, every 14th name will be selected, starting with the 4th name):

	4+14	18+14	32+14	46+14	60+14	74+14
4,	18,	32,	46,	60,	74,	88

You will need to continue until 7 names are selected.

STEP 3. If one of the selected people is unable or unwilling to participate, you may go to the next name on the list, but do not change any other selections.

For example:

If the 4th person is unavailable, go to the 5th, 6th, etc. until you have made a selection. The next person will still be the 18th.

For Faculty:

STEP 1. Divide the number of names on the list by 3. Be sure the list includes both full and parttime faculty. This will give you "n" (the number of the intervals).

Example: 13 faculty $\div$ 3 = 4
n = 4

STEP 2. Starting with the 2nd name on the list as the first interviewee, pick every "nth" name until you have 3 people selected.

Example: These are the names you will select:

(2+4) (6+4)

2, 6, 10

STEP 3. If the person selected in this way is unable or unwilling to participate, go to the next name on the list, but don't change the next number in the selection sequence.

Example: In the example above, if #2 is unavailable, you can go to 3, 4, and then 5. The next person would still be 6.

NOTE: It is very important that you try to get the person who is designated first. Please do the best you can to get the person who first falls in the sample.

DEFINITION OF FACULTY: Any faculty person who teaches any course or courses in the Master's Program should be on the list you select from. If the dean or director is teaching a course or courses during the current year, he or she should also appear on the faculty list.

NOTE: Since some schools in the interview survey were also in the mail survey, you may run into a situation where the people selected for interviewing may have received a mail questionnaire. We have deliberately set it up so that this will happen in some of our interviews. Please tell the person that we do want to interview him or her, even though they responded to the mail survey. We want to interview that person even if they didn't return the questionnaire they received by mail. Explain that some of the questions will be the same but that the interviews will give us a chance to discuss the responses.

This will hold for both students and faculty. Please note on the cover sheet if the person being interviewed responded to the mail survey.

Interviewer Packets

1. 21 student interviews　　10 faculty interviews　　(for each school)
BLUE　　YELLOW

2. Manuals: Student/ Faculty/ General
BLUE　YELLOW　WHITE
COVER　COVER

3. Contract letter WHITE

4. Copy of Dean Galvin's 2 letters to library school administrators

5. School profile (completed as far as we know) 2 copies
GREEN

6. Sampling strategy for each school

   The following has been prepared for your school and tells you which numbered names on the list you are to select for interviewing.

7. Cards: marked for Student/Faculty Interviews

University of Pittsburgh
SCHOOL OF LIBRARY AND INFORMATION SCIENCE

To Interviewers:

For your information.

Copies of letters sent by Dean Thomas Galvin to the deans and directors requesting their participation.

The first letter was sent to the deans of the 32 library schools that were in the mail survey sample. Questionnaires were distributed to all students and faculty, and a general school survey was the third instrument.

The second letter was sent to the other 30 schools that were not in the mail survey sample. Those schools were asked only to complete the general school survey.

Your schools may or may not have been in the mail survey, but all the directors and deans received one of the two letters from Tom Galvin describing the study.

LIBRARY AND INFORMATION SCIENCES BUILDING, PITTSBURGH, PA. 15260 (412) 624-5230

Letter to Deans/Directors of Library Schools Requesting Participation

University of Pittsburgh

SCHOOL OF LIBRARY AND INFORMATION SCIENCE
Office of the Dean

February 22, 1980

Dear

One of my faculty colleagues, Dr. Sara Fine, has just completed the first phase of a comprehensive three-year research study of Librarians' Resistance to Technology. The results of this first large-scale survey of public librarians' attitudes toward technological change, sponsored by USOE, are now available as Project number 475AH70073 and will soon be available in published form. I hope you will have an opportunity to review this report and that you will feel, as I do, that it illuminates a phenomenon of major importance to librarianship.

I am writing to ask your personal assistance in the next stage of Dr. Fine's investigation. The initial results strongly suggest that professional education can potentially exert a major influence on professional attitudes and behavior in an environment of rapid technological change. Consequently, Dr. Fine has been encouraged by USOE to extend her research to an examination of the relationship between library education and resistance to technology.

The objective of this next phase of the study is to systematically gather data on the perspectives of current students and library school faculty. The intent is not to request detailed statistical data about the schools (as in the recent AALS survey), but through student and faculty responses to a brief attitude measure, to gain insight into the nature of the process of professional education and the formation of professional values. All data obtained in the study will be reported only in aggregate form, since the focus is on library education in the large, rather than on individual schools.

To assure that the data are representative, full participation by your school is essential. You will be contacted soon by telephone by a member of the project staff and asked to approve your school's participation. At the same time, you will be asked to name a contact person to be responsible for distributing questionnaires to all first professional degree candidates and library school faculty and facilitating responses from your school.

LIBRARY AND INFORMATION SCIENCE BUILDING, PITTSBURGH, PA 15260 (412) 624-5230

I am writing you now, in advance of your being contacted by the project staff, to personally request your cooperation and support for a study that I genuinely believe offers real potential benefit to all of us.

Sincerely,

Thomas J. Galvin
Dean

TJG/jr

LETTER TO SCHOOLS NOT IN MAIL SURVEY

University of Pittsburgh

SCHOOL OF LIBRARY AND INFORMATION SCIENCE
Office of the Dean

March 3, 1980

Dear

One of my faculty colleagues, Dr. Sara Fine, has just completed the first phase of a comprehensive three-year research study of Librarians' Resistance to Technology. The results of this first large-scale survey of public librarians' attitudes toward technological change, sponsored by USOE, are now available as Project number 475AH70073 and will soon be available in published form. I hope you will have an opportunity to review this report and that you will feel, as I do, that it illuminates a phenomenon of major importance to librarianship.

I am writing to ask your personal assistance in the next stage of Dr. Fine's investigation. The initial results strongly suggest that professional education can potentially exert a major influence on professional attitudes and behavior in an environment of rapid technological change. Consequently, Dr. Fine has been encouraged by USOE to extend her research to an examination of the relationship between library education and resistance to technology.

The objective of this second phase of the study is to systematically gather data on the perspectives of current students and library school faculty through the administration of measures of attitudes toward technology, librarianship and library education.

Your school was not one of those selected for inclusion through a stratified random sampling procedure. Your faculty and students will not be asked to participate in the study. However, it is important that some information be obtained from all the accredited library schools so that the information about library education may be truly representative.

I am writing to personally ask you to participate in this project by completing the enclosed questionnaire. This questionnaire, which represents one segment of the data being collected, may be filled out by you personally or by someone on your administrative staff.

LIBRARY AND INFORMATION SCIENCES BUILDING, PITTSBURGH, PA. 15260 (412) 624-5230

Please complete and return by April 8th. All data obtained in the study will be reported only in aggregate form since the focus is on library education in the large, rather than on individual schools. I urge you to participate in this study that I genuinely believe offers real potential to all of us.

Sincerely,

Thomas J. Galvin
Dean

Interviewer's Observation Sheet

Please make notes on any impressions that you have about the Library School at which you are interviewing.

Name of School:

Interviewer:

Was the school in general receptive to you?

How would you describe the level of activity in the school?

Had students been prepared for your call?

Did you see any evidence of technology in use?

Any other observations?

The Interviewers

INTERVIEWERS

1.	Dorothy Anderson 538-38-4353	1317 Austin Street Denton, Texas 76201 Phone: home 817-382-0198	4 schools UCLA USC TWU N.T.U.
2.	Ethel Tittnich 172-30-9565	5805 Callowhill Street Pittsburgh, Pennsylvania 15206 Phone: home 412-362-7743	4 schools ATLANTA EMORY CHICAGO ROSARY
3.	Dr. Leigh Estabrook (also coordinator) 579-56-7397	327 Canterbury Road Rochester, New York 14607 Phone: home 716-271-7813 work 315-423-2911	1 school GENESEO
4.	Francie Bennett 535-58-2681	2235 Fairview East Houseboat #3 Seattle, WA 98102 Phone: home 206-323-7363 work 206-447-3883 other 206-325-2243	1 school WASHINGTON

INTERVIEWERS AND INTERVIEW COORDINATORS

BIOGRAPHICAL INFORMATION

Dorothy J. Anderson is currently a consultant to the Evaluation of the Illinois Interlibrary Cooperation Project, and the Southwestern Library Association and is a doctoral candidate at the Texas Woman's University. She was formerly Director of the Washington Office of the Leadership Training Institute, Florida State University; Associate Director of Media Services, and Associate Professor of Media Sciences, Federal City College; Illinois State Library Consultant; and Professional Assistant, Children's Services Division, American Library Association. She has conducted many workshops for librarians, chiefly in the areas of management, evaluation and interpersonal communication.

Francie Bennett is currently a candidate for the Master of Social Work degree at the University of Washington. Her experiences include clinical counseling with individuals and couples, crisis counseling with families and facilitator in communications skills training programs. In addition, Ms. Bennett has served as a research assistant on several projects at the University of Washington and has been a member of review and advisory boards for social service programs in Idaho, Oregon and Wisconsin.

Ethel Tittnich is currently enrolled in the Doctoral Program in Interdisciplinary Information Science at the University of Pittsburgh. She is employed part time as a Research Associate in the School of Library and Information Science. Ms. Tittnich has a Master of Science degree in Child Development and is a Clinical Assistant Professor in the Department of Child Development, Child Care, School of Health Related Professions at the University of Pittsburgh. She is currently teaching a course on Play to undergraduate students at the University of Pittsburgh and at the Community College of Allegheny County and a course in Counseling Skills in the Department of Library Science.

Leigh Estabrook is currently an Associate Professor at the School of Information Studies, Syracuse University. Dr. Estabrook received her Master of Library Science from Simmons College in 1969 and her Ph.D. in Sociology from Boston University in January, 1980. She is currently teaching courses on Marketing of Library and Information Systems, Business Information Resources and Social Science Information among others at Syracuse University.

University of Pittsburgh
SCHOOL OF LIBRARY AND INFORMATION SCIENCE

Dear

I am writing to invite you to participate in the research project on Library Education and Resistance to Technology which is currently underway at the School of Library and Information Science. As you know, this project is funded by a grant from the U.S. Office of Education and will include a national mail survey and an interview survey at selected library schools.

Your contribution to this project will be to coordinate the interview procedures at one or more of the interview sites. The specific tasks involved and the time frame are described in more detail on the attached sheet. The fee for this part of the project is $100 per consultant day for a total not to exceed $. The days on which these services will be performed will depend on arrangements made with the individual schools. Allocated travel expenses are also listed on the attached sheet.

If these arrangements are agreeable with you, please sign this letter where indicated and return to me. Please include your social security number.

Would you also please send me your vita with this letter.

When your work has been completed, please send me an invoice listing the days on which service was performed ($100 per day for a maximum of days). Also please send your travel expenses as outlined on the attached sheet. It is important that all bills and travel expenses be submitted promptly as work is completed.

I look forward to working with you. Please call if you have any questions.

Sincerely,

Sara Fine

Sara Fine
Project Director

SIGNATURE

Social Security Number

Home Address

LIBRARY AND INFORMATION SCIENCES BUILDING, PITTSBURGH, PA. 15260 (412) 624-5230

ALLOCATION OF FUNDS

(Please sign and return when interviews are completed)

The following represents the maximum allocations for expenses relative to Interview Phase at the school(s) to which you have been assigned:-

AIR FARE:

GROUND TRAVEL:

PER DIEM: number of days:

Amount for completed interview: Number of interviews:

Name of interviewer:

Address of interviewer:

Social Security number:

Vita (one paragraph): Please return with this letter.

Please sign this form and return, together with airline ticket, travel expense vouchers and a list of expenses. Please return these forms as soon as interviews have been completed.

I understand that the above represents a maximum amount that will be reimbursed for the Library Education Interview Phase.

Signature: ______________________________

PART II

BACKGROUND PAPERS

PART II

BACKGROUND PAPERS

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Introduction

This chapter of the report on library education and the process of technological change is a compilation of background papers which were written for this project by five specialists in education for librarianship. A sixth paper was written by a recent graduate in information science who is currently teaching information science courses in a small college. The purposes for including these essays were, first, to provide a current backdrop for the study through the reflections of people who are intimately concerned with the issues this study addresses. The second purpose was to collect opinions from the field about the nature of the problems facing library education and to transform those opinions into hypotheses for testing, both within the context of this study and as identified areas for further research.

The topics for these papers were assigned to the writers according to each author's recognized area of expertise and experience. Each brought a different perspective and a different context from which to present a point of view. Yet there are common themes running through these papers that strongly suggest where attention needs to be focused. For example, three of the writers independently raised the question of expanding the length of the Master's program, one writer suggesting a fresh approach that would involve a different structure to the academic experience. Other common opinions were voiced; for example, that library school faculty are not adaptive to technological changes in the profession. Commonly perceived needs were addressed; for example, that library schools need to prepare students to work in environments other than libraries. These papers reflect, in a personal way and from a personal perspective, the concerns that are being voiced in the library education literature. In many instances they reflect the assumptions upon which this study was developed.

Following are the background issues and writers:

The State of Library Education; Dr. James Matarazzo, Associate Dean, Graduate School of Library and Information Science, Simmons College; Boston.

Information Science Education for Librarianship; Dr. Robert M. Hayes, Dean, Graduate School of Library and Information Science; University of California, Los Angeles.

Perspectives from the Profession: An Administrator's View of Library Education; John H. Rebenack, Director, Akron-Summit County Public Library; Akron, Ohio.

Needs for Future Research in Library Education; Dr. Ruth Katz, Research Scientist, Denver Research Institute.

Education for Information Science; Allen Kent, Chair, Information Science Department of the School of Library and Information Science and Distinguished Service Professor; University of Pittsburgh.

A Student's Perspective on Information Science Education; Dr. Eileen Trauth, recent graduate (1979) Interdisciplinary Department of Information Science, University of Pittsburgh; Department of Computer Information Systems, Bentley College, Waltham, Massachusetts.

The State of the Art of Library Education: A Personal View

James M. Matarazzo

Education for librarianship in the United States has not changed radically in the last fifteen years. Indeed, what is taught and how it is taught have remained remarkably constant, which is no doubt a reflection of the fact that libraries and librarians are essentially the same as their predecessors of 1965. This is not to suggest that the available tools, techniques, methods, and technologies have not expanded the potential of the profession or the institutions. These new developments have had an impact on the profession, and their presence on the curricula of the library schools is a matter of record.

Meeting the Shortage

Fifteen years ago library schools were in the process of responding to the demands of the profession for increased numbers of graduates to fill the many and growing numbers of vacancies. With their rather small full-time faculty, augmented by large numbers of part-time and summer faculty, the schools proved themselves equal to the task in part by increased enrollments in existing schools, as well by developing new programs in institutions where none had existed before. While enrollments were increased by recruitment efforts both within and outside the schools, tuition assistance was provided by the federal government through the Office of Education and by a variety of work-study opportunities. In fact, with a job often guaranteed prior to graduation, large numbers of students were attracted to the field. For many of the established library schools, however, this influx of students provided a rare opportunity to increase the number of full-time positions and, for those universities with new programs, time to enlarge both the number of faculty and size of the student body.

Homogeneity of Programs

A casual glance at the catalogs of the library schools in 1965 would confirm that the course offerings were very similar, less the occasional variation in course title. In the area of administration, a student could find a specialized course in each of the four major types of libraries. Naturally, courses in cataloging, children's literature, government documents, the history of books, reference, bibliography of the sciences, social sciences, and the humanities, as well as courses in young adult literature, technical services and book selection were certain to be represented. A smaller number of schools offered coursework in abstracting and indexing, management, personnel administration, communications, publishing, audio-visual materials, information storage and retrieval documentation, and adult education. While there was strong similarity in the programs, the courses in fact reflected the then current interests and needs of the profession. Where there was small interest in a specific area as expressed by those in practice, fewer schools were seen as offering those courses. Some were inclined to attribute the uniformity of content of the programs to the 1951 Standards for Accreditation, and while some of program characteristics were no doubt a result of those standards, the professional community and its demands (or lack of demands) also helped shape the programs of the schools.

Growth of the Schools

The state-of-the-art of library education from 1965 to 1972 did reflect change. The more noticeable changes were increased faculty at the schools, as well as larger and larger graduating classes. Both of these resulted from the demands of those in practice to meet the staffing needs of libraries, which were also in a growth cycle in terms of size and number.

Smaller changes in the curricula of the schools also represented emerging interests of the profession. These included courses in communications, audio-visual materials, personnel administration, and information retrieval.

During this period, the programs in library education did not lead in the curricular reform but rather followed closely the demands of those in practice. This does not imply the library school faculty were not professionally involved in associations or in research and publications. Given the size of the faculty of these schools, it was achievement enough that the system could adjust both in terms of the master's and doctoral programs to meet the demands placed on them. In reality, the profession wanted staff to fill vacancies, and the process of educating the required numbers was of secondary consideration to those in practice.

While librarianship was in a growth cycle, major research efforts were underway at a number of institutions. I was employed at the libraries of the Massachusetts Institute of Technology during one of these funded projects, Project INTREX. This program began in 1965 with a conference where the plans for the experiments and for the research and development were discussed. The coverage in the literature for this research was extensive and included progress reports issued by the project staff, as well as articles in the professional literature for scientists, computer engineers, and librarians. These printed reports were augmented by a series of speeches by staff members all over the United States, as well as by frequent demonstrations to groups of librarians from this country and abroad. Since I attended a number of these presentations, I made it a main objective at these meetings to observe the reactions of the leaders and the rank and file of our profession. The response of the profession to these experiments, which combined computer technology with information transfer, was largely negative. It was unclear to those who watched and listened why all this money--money they felt they might better use in their institutions--was being expanded. Few could even appreciate the research value of the experiments and almost none could relate what was going on at INTREX to their own library operations.

Until the 1970's, the profession, while jealous of the funding, rejected large computer applications to library operations, and the schools which served them reflected this lack of interest and application in the master's curriculum. Once this technology was accepted, however, the schools were expected to react by establishing appropriate courses.

New Standards and Fewer Positions

In some respects, the 1972 Standards for Accreditation are more permissive than previous standards in terms of curricular demands placed on the schools. Briefly, the schools are required to establish goals and objectives which they meet by providing appropriate faculty, students, curriculum, and physical facilities, while demonstrating that their governance structure allows them the freedom and resources to conduct their program. If for no other reason, the process of meeting the new standards and the required review and study of the whole program of the school might have led to major changes in curriculum. While acknowledging the freedom to plan such programs, the schools, previously lamenting this lack of freedom, did not dramatically alter their programs of instruction. Even today, we are able to select a series of library school catalogs and verify the similarity of programmatic offerings with earlier versions.

However, the number of course offerings increased as the number of faculty increased and as new faculty with new abilities and interests were added, either as a result of the addition of positions or as replacements for the large number of now retirement-aged faculty. On the other hand, the expansion of the programs was tied less to curricular inventiveness than to the influence of those in practice with specializations in various functions or types of libraries. In addition to courses in the four major types of libraries, the following specialized types of library courses could easily be identified in a large number of schools: medical, music, art, newspaper, law, hospital, and theological.

Similarly, more schools began offering courses in research methods, information science, reading, and library automation. As those in practice perceived an increasing role for the success of libraries and library legislation, demands were made for increased coverage of the political process in the curriculum. As long as the shortage of librarians was a factor, however, the schools sought and received little advice from the practicing professionals. Once the employment balance shifted, those in practice could turn their attention to the programs of the schools, and did so.

Almost overnight the supposed shortage of qualified staff was eliminated and the schools, recently struggling to enlarge quarters and staff, were asked to reduce the flow of graduates. At the same time, the profession demanded a curriculum more responsive to the new technologies, especially on-line, interactive systems, while seeking appropriate attention to the growing areas of specialization.

As enrollments began to peak both at the library schools and at their parent institutions, eager budget-cutters cast a critical eye on every part of the whole. Library schools initially escaped much of the reduced funding because their only demands were for classroom space, library materials, reams of paper and paper-related products, plus some audio-visual equipment which could also be used by the parent institution. Once the enrollments of the schools began to ebb in a steady downward plane, reflecting the tightening job market for their graduates, they could no longer hide from the budget-cutters. Coincident with enrollment decline, the schools demonstrated the need for expensive equipment, more computing time, and costly subscriptions to data bases, all of which were necessary to meet the demands of courses for students and continuing education programs for alumni.

Often staffed with faculty who were unable to teach in the new areas of the curriculum, the schools had no choice but to wait for new openings through retirement or for current faculty to leave before the staff necessary to teach in the new areas could be assembled. Sensitized in the past by a profession which often reacted to every new fad that paraded by the library, the schools frequently waited to see just how long-lasting this or that new technique or new interest would be. Once certain of the task before them, the schools set out and often achieved their goals. This whole process, however, did not place the schools in a leadership role nor did it allow them to keep pace with the profession. In fact, it demanded that the library schools delay action for two to five years until an identifiable direction for the new trend could be established. In one respect, however, library education may have been wise to delay its actions or the schools would have been cluttered with equipment no longer in use or offering coursework in a fancy which, at the time a passion of the profession, proves itself but a brief interlude in a never-ending line of new but often fleeting interests.

Cataloging and Classification--The Cutting Edge

Because of their involvement with on-line, interactive data bases, cataloging instructors appear to me to have been on the cutting edge of library school faculties. While second to the audio-visual specialists in introducing new equipment to the schools, the cataloging instructors, often tolerated by their colleagues but seldom held in high esteem, provide us with an example of a healthy attitude toward change. In an organized and systematic program of continuing education through a variety of conference meetings and informal information transfer from professor to professor, new rules, techniques and equipment were introduced in cataloging courses with little fanfare and confusion. As a consequence, students face the OCLC terminal with little fear and often with great enthusiasm. Instruction in these areas has frequently been extended to alumni, either through continuing education programs or post-graduate coursework.

The challenge to this group of library educators is twofold. As in the past, new data bases are available to catalogers and these will require the addition of new equipment to access these systems, as well as funds to access the services. At the same time, these conscientious instructors must come to realize that the need for an informed body of users of catalogs is far more important than the continued emphasis on producing individuals who are able to catalog. The balance is shifting from catalog creation to catalog use, and the educational system must adjust at the core or required-course level. Whatever is lost in this shift can be made up by provision for new or expanded elective courses for those who wish to select catalog construction and theory as a career path.

Specialization

Those in library education are torn between the need for specialized courses and the continued fractionalization of the curriculum into smaller and more discreet pieces. The danger is that the students, faculty, and practitioner will lose sight of the curriculum as an integrated whole. Librarians and librarianship are concerned with the organization, storage, and retrieval of information, regardless of the type of library or specific function they perform. Common sense demands and the Standards require that the curriculum provide basic instruction in those areas common to all of librarianship. The schools have responded with either an array of required courses or an integrated and extensive introductory course often referred to as the "core." Additionally, elective courses in types of libraries and specific library functions continue to proliferate, often encouraged and frequently taught by practitioners in the immediate locale of the school.

The faculty of the schools have an obligation to protect the profession from dividing itself into a large number of discreet specializations. The field must be presented as one whole, and the program of instruction must provide for the basic fundamentals while allowing for introductory exposure and/or concentration through elective courses. All of this should be presented and understood as part of the whole which, for a century, we have called librarianship.

Information Science

While the whole area of information science requires further definition, we can tell at a glance from the changed names of the schools that it has found a place in many library school catalogs. Often offered as a specialization through a series of courses and less frequently presented through a separated department or division of the schools, it has not been a unifying force for either the faculties or the practitioners. Under the guise of vaguely labeled courses, information science instruction is frequently a lesson in computer programming with data manipulation as its center stone. All too often the relationship of these courses to the curriculum as a whole is vague and its content is frequently devoid of references to librarianship in general and to practical applications in particular.

The present situation developed when faculties, familiar with the two to five years' lead time, hesitated too long and were overwhelmed by student, practitioner, and in some cases, individual faculty demands. Unfortunately, with the enrollment decline, the power of the faculties gave way to the realities of economics and the appeal of being one of the schools at the leading edge.

The lesson is that the goals of the schools have shifted from supply to competition for a smaller and smaller number of students. Faculties, now accustomed to a specific life and teaching style, appeared to ignore the progress in information science, perhaps bolstered by its lack of definition. The point is that faculties must leave the schools and attend those meetings where new ideas are being discussed and demonstrated. This will also mean monitoring the literature more closely to augment the meetings and incorporating these ideas into their courses, if appropriate, or referring information to colleagues for possible integration into their existing courses. If this had been done in the past, perhaps the techniques involved with on-line search of data bases would be covered in reference courses together with other tools, rather than being scattered in a number of courses or worse, being taught as a specialization in isolation from the rest of the curriculum.

Along these same lines, the schools and the administration of the parent institutions must provide funding for faculty development. These funds would at least provide an opportunity for faculty to remain current while engaged in their already time-consuming loads of teaching, research, publication, student advisement, and service on a variety of committees, either at the institution and/or at the professional association level. Should these funds fail to materialize, sabbatical leaves will have to be utilized as a means for intensive professional development, including further formal coursework. Depending on the faculty member and circumstance, the deans of the schools may have to insist that sabbatical leave be a time for faculty renewal and not a half-year or year of vacation and travel. This will be especially true for those faculty members whose areas develop more quickly, as well as for those instructors whose areas are no longer of interest to students.

Students

In the last fifteen years, the average age of the students in library schools has dropped dramatically, but the students themselves have not changed. Library students are, in general, strong in academic ability, with higher verbal skills and lower interest and acumen in mathematics. Most have had some experience working in libraries and some have had work experience in libraries at every level of their educational experience. Others, failing to secure employment in their chosen area, have found positions in libraries after the award of their baccalaureate degrees. Many, in fact, have a subject or professional master's degree prior to their admission to library school. In most schools, as in the past, female students outnumber male students by a ratio of four to one. In summary, the students are in the main of high academic caliber and are almost always referred to the field by practicing librarians who share many of these same characteristics.

Perhaps the most significant aspect of what has been described is that those in practice are the key to the selection process as to who will enter, or at least consider entering, the profession. Those in practice, in my experience, are most likely to select those who have similar abilities, interests, and personalities as their own. Thus, regardless of the advances in the field, the students, and therefore the graduates, are very similar to students fifteen years ago.

I do not suggest that this is entirely undesirable. I do suggest, however, that those students particularly aggressive by nature, or otherwise different from those present in the profession, are unlikely to be referred to librarianship as a career path.

Even if a few students with markedly different characteristics of personality or interest graduate from the schools, their reception into the profession will not be pleasant and the process of acclimation to expected norms of attitude and actions will begin immediately. This will lead either to an adjustment on the part of the uncharacteristic graduate, or to his/her leaving the field.

My experience with most graduates suggests that they are not likely to take risks at all. This extends to taking positions away from their friends and families to a preference for the familiar, be it an institution, type of position or specialization. The graduates of library schools are on the whole service-oriented and socially responsible. Generally they are not, at the point of graduation, career-oriented or highly motivated to advance through the professional ranks.

Many students attend graduate schools almost out of reflex action. It seems to me, and many others, that the American experience prepares students to be students for life. The pursuit of the library degree, then, follows and is reinforced by a lifetime of rewards for academic performance. Skilled as students and best trained for academic achievement, many graduates of library schools are uncertain of their abilities outside the classroom. For some graduates, then, librarianship offers a respectable, low-risk opportunity to test themselves against other professionals in practice. With anywhere from three to five years' experience as a librarian, many graduates leave librarianship to pursue careers they were hesitant to attempt prior to the degree program in library and information science, and without a time to measure themselves against others in practice. For many, the degree and the ability to gather and organize information provides not only a useful, often competitive, very advantageous opportunity, but also a time to prepare to launch into another career path which was, in fact, their first choice. Most frequently, this has led library school graduates into law, business administration, and marketing.

For some baccalaureate-degree holders, and even for some who have completed as many as two other non-library master's or higher programs, and/or for those who have been unsuccessful at their profession or, more likely, unable to secure employment, librarianship is an alternative career. These individuals are cautious in library school and conservative upon graduation. Rather than excel as librarians, many simply want to find and hold on to a position. Most of these graduates will advance in the profession only if they are forced to by dint of experience, or if a mentor in practice guides their future development in a highly personalized way.

All in all, students in library schools receive far too little career guidance and placement assistance. As a result, and for those who survive the first years of practice, they gradually develop career plans of their own. Unfortunately, as personal and family responsibilities develop over time, many graduates realize their true potential as many as twenty years after graduation. As a result they often find themselves trapped in an institution or in a position by circumstance, and thus unable to change their careers at this stage in life. For many, by the time they recognize what was possible, they are at a stage in life when security and other considerations are more important than career.

This suggests to me that the schools should make a concerted and sincere effort to provide career-planning programs for students. In order to prepare students for a life-long career, the schools should provide both courses in the master's program, and career-guidance staff as advisors. This seems especially important as the various schools develop a regional as opposed to national student body and place their students, for the most part, in the same geographic area as the school.

In a time when women are proclaiming increased freedom of choice in career or other matters, one need only check the placement records of the older schools to find that graduates of 1930's demonstrated more mobility than graduates of the 1970's. While acknowledging that there were fewer library schools in the 1930's and that the placement of the 1930's graduate may simply represent a return for these students to their home state, it seems obvious that students journeyed some distance to attend the school of their choice. Currently, students of both sexes have more personal and societal freedoms than their predecessors of the 1930's and yet, current graduates appear less willing to leave their own region to attend the best school. While this may reflect an additudinal change in the meaning and importance of work, it also suggests that the students of the 60's and 70's were even less career-oriented than were the students of the 1930's. This could also be true of the students in the 80's and 90's as well.

Alumni

In a one-year program, school loyalty is difficult to foster. Also, many students have only a nodding acquaintance with one another in classes composed of full and part-time students. While groups of students do develop strong friendships, these positive feelings are not necessarily extended to the school.

As with any human endeavor, many alumni form attachments to the school, faculty, and administration and offer to help with the activities of the alumni association or with fund-raising events. Often, alumni efforts in the form of labor or verbal support are greater than the advice they received while students. It is, however, an acknowledgement of a debt to the school that helped them succeed in a profession with which they are more than satisfied. It is curious that schools and faculties do not extend themselves more to the students in a personal way.

The future seems to suggest that schools become more dependent on alumni contributions to help stem the rising cost of education. In a time of job shortage, alumni are very helpful in job referral and placement. Often they only have to be asked to help, and they give of their time and talents in a very generous manner.

Alumni can also be a source of support and guidance to the administration and faculty in matters of curriculum. The dialogue between the schools and their alumni seems to be a lower point than it need be. The schools feel that any invitation to alumni for advice and assistance might lead to interferences with the educational program. As such, alumni, a source of strength, have frequently been tolerated and courted only when fund-raisers or reaccreditation looms in the immediate future.

In fact, most alumni are assets to the graduate library program, often giving of themselves without expecting the school to bend in any academic area. Perhaps the most sensitive of these areas is that of student admission.

As previously discussed, I feel very strongly that area alumni are often the referral agents for the future student body of the school. With the reductions of enrollments now in progress, alumni would prove fine filtering agents who, given a desire to strengthen the schools, would be unlikely to refer inferior students to their alma mater. As rejection rates at schools hover close to zero, the alumni may be seen as a source of student recruitment. It seems to me that they would be less likely to respond to this particular problem unless they have been involved previously with their school.

The points of contact with alumni are obvious and include placement, guest lecturers, alumni association activities, practicum opportunities and the like. Perhaps the alumni of the school, those most closely associated with the graduate programs, have been the most ignored. All of the potential alumni support should begin at the student stage. Strong relationships between students and faculty must be encouraged. Loyalty to any institution is developed gradually and is very difficult to dislodge. Years of neglect cannot be repaired overnight.

The Environment of the 1980's

For the next five years enrollments in library education are likely to continue to decline. With approximately 5000 library school graduates a year and a higher number needed to meet current demand, I expect a five-year time delay between the recognition of this fact and the appropriate response of the practitioners--that is, referral of students to the schools. With a decline in student enrollment, library schools will be pressed to increase enrollment or be threatened with the eventual loss of both staff and funding. While some deans may urge faculties to go out and seek government and other funded research contracts, the number available will not be sufficient to save all or even most of the schools from personnel and material reductions. Since at many schools the faculty most recently hired are in the area of information science, they will be the first full-time faculty to be cut back. Similarly, the part-time faculty, often the practitioners, will also be reduced or eliminated. This sequence will further isolate the remaining faculties and the schools from the profession.

The central tasks for library education in the 80's are as follows:

(1.) In spite of the shortage of master's students for the first professional degree, the schools must continue to strengthen the master's program while devoting increased energies and resources to excellence in teaching, recruitment and curriculum development. Efforts should be redoubled to further define the master's programs so that the student is aware of the realities of practice while at the same time being prepared to contribute to the possibilities in the profession during their first few years.

Proper attention must be given to the core or required courses to insure that the essentials common to all libraries and information-handling organizations are covered. A balanced approach to a series of elective courses in the specializations which will at the very least provide an accurate representation and introduction to these areas must be provided as a part of the program. All of this must be done against the background of librarianship as a unified profession.

(2.) A second master's program at the schools ought to be begun so that graduates could return to the school after an appropriate length of practice and specialize in administration or in one of the many subject or functional areas in librarianship. In my judgment, we have for too long tried to cram too much into a one-year master's curriculum. Even extending the first professional degree to a second year is only an acknowledgement of our failure to provide a program of preparation for the first years of practice. A second master's degree program, quite separate from the two-year master's, will provide those who wish to specialize a degree program which will be offered to returning librarians who want to prepare for greater responsibility or expertise.

(3.) If there is to be training for the paraprofessional who works in a library, then the library schools ought to offer such training. Few educational institutions will have better qualifications in terms of faculty or resources to offer such a program than the accredited schools.

(4.) Career guidance for currently enrolled students is a need which cries out to be met and one which ought to receive the necessary human and monetary resources to make it a reality. Along with the decline in enrollment, there has been an increase in the number of part time students which is likely to continue. As the part time students increase, so will the average age of the students enrolled in the first Master's degree program. As the age increases, the length of the careers of these graduates will be shorter, thus making planned careers increasingly important.

(5.) Research in librarianship has not been concentrated on the field itself but rather on other fields relating to librarianship. The time has come when librarianship has to turn some of its research capabilities on itself for intensive and extensive study. Among the items which should receive initial attention is the career patterns of librarians, especially the recent graduates. We must, for example, determine why so many of our new graduates leave the field and what human resources are needed to balance the supply and demand of librarians. In the recent past we have fluxuated between shortage and over supply, in part because we lack valid data on the number of librarians and information professionals required.

Perhaps through research we can learn more about our profession. If this research takes place under the auspices of library education, we will be able to lead the profession in an informed way. We have reacted well to the profession in the past and, in fact, do our jobs exceedingly well. The time for leadership is at hand and research will provide the means to make this a reality.

(6.) The faculties in our library schools must demand that the basic principles and theories of information science be integrated into the curriculum. This should be accomplished by integration at the course level, since the presence of a separate series of courses or a separate division only promotes the idea of two or more professions within librarianship. This division is unhealthy and contributes significantly to the confusion of where and how librarians and information professionals will be trained and educated.

The faculties at our schools will have to learn to work together and compromise while insuring that the essentials of both areas are conveyed to new entrants. The prolonging of the division between librarianship and information science, while it may please individual egos, weakens the profession. It also provides ample opportunity for other student-short fields to claim a new area of speciality in an era when survival hinges on student enrollment.

(7.) The library school, often isolated, will have to gain more visibility at the college or university level. This will require greater participation of the administration and faculty on university-wide committees or assemblies in order to gain the necessary support to carry out their programs. Not only is there much to be gained by cooperation with and exposure to other departments, but most library faculties will find themselves in a position to help their schools. The upper management of our colleges and universities will support the programs they believe will be outstanding and those programs which will reflect well on the institution. Those programs out of the visibility of the managerial eye and those not contributing to the goals and objectives of the university are only insuring a more than proportional share of reductions. Perhaps the deans can lead the schools out of academic isolation and insure the vitality and health of the school in the future.

(8.) A closer alliance with the profession is also an immediate need for library education. We have co-existed for some years, with neither those in practice nor those who teach apparently willing to call a summit and arrange for terms. It is in the best interest of the schools and of the profession to foster a closer relationship. Those in practice need the education arm as much as library education needs the practicing professionals. I suggest that a closer relationship with our alumni will lead naturally to a strong alliance among all the players in our relatively small world.

Those in library education must realize that reduced enrollments are going to play havoc with budgets and personnel. Some of this frustration will inevitably spill over to the faculty and create some anxiety and distress among our colleagues. Similarly, we must all realize that increased part-time enrollment will create greater burdens on both faculty and administration of the schools. With reduced student loads, however, library education has the time to regroup, study, and plan for the inevitable swing of the enrollment pendulum. This brief respite can bring increased programmatic strength, new alliances with alumni and those in practice, and a closer relationship with our own student body. All of these, once acknowledged and faced head on, can bring us into the 1990's with renewed optimism and even greater strength.

Education for the Librarian as Information Scientist

Robert M. Hayes

The invitation to write this paper specified that the intent was not to provide a study of current practices, but rather to obtain the observations, beliefs, and reflections of one who has been deeply involved in bringing this field to its present state. I interpret this as a request for a highly personal, perhaps even anecdotal review of my own views, as they have developed over the past couple of decades and as they are now. I am going to approach it in this way, and this introduction in a sense is in the spirit of that kind of an approach to this topic, namely, it is a rather informal conversation rather than a formal lecture.

Before going into the specifics that provide the detailed examination of "education of librarians as information scientists," as I view it, I think it is worthwhile to set the stage by identifying the basic orientation with which I started in this line of thinking and development somewhat over twenty years ago. At that time, I was deeply in the computer business, concerned specifically with "product development." Information science didn't even exist as a term as far as I can remember. Although the concept of "information storage and retrieval" was a focus of much interest, it was rather peripheral to my own work. And librarianship, if I thought about it at all, was viewed as a profession which I admired but certainly did not see as a focus of my own interests.

Probably just one event changed all of that. It happened on May 14, 1958, as I was returning to the old Wardman Park Hotel in Washington, D.C. from business in downtown Washington. The bus stopped at the Calvert Street Bridge, and I noticed for the first time a small, detached building with a sign saying "Documentation, Inc." For whatever reason, I was intrigued, got off the bus, entered the building, and asked the receptionist, "What is Documentation, Inc. and what does it do?" She said, "Why don't you ask Dr. Taube himself; he's right behind you." That was at 4:00 PM. Three hours later, we were still talking, exchanging ideas, concepts, practicalities, and dreams in a marvelous free flow of conversation.

It turned out that Mort and I had so many areas of mutual interest that we forged almost immediately a friendship that lasted until his death many years later. Mort was so broad-gauged that I'm sure many other people had the same feelings of instant intellectual communication that I experienced, but for me they represented a major turning point. I became increasingly interested in the problems in applying computers to the kinds of retrieval problems that Mort and I had discussed.

There was, of course, much more involved in this turning point than the conversation with Mort. My own technical work was focused on the development of equipment for mechanized access to large files of data--in both digital form, in the Magnacard system, and photographic form, in the Minicard system. The issues that were of concern to me in applying such equipment were exactly those that lay at the heart of Mort's concepts. That was what made the rapport so instant, even though we came to the problems from radically different starting points. But more to the point of this paper, they were among the problems that underlay the development of what has since been identified as "information science": How does one establish and organize large files (truly large files, larger than the equipment at any given time is really capable of handling) in such a way as to be able to communicate with them and retrieve from them?

Of course, those problems with which I was concerned at the time were only a small part of the large array of problems that were coalescing into this new field. Language translation, pattern recognition, thesaurus development, the logic of retrieval, criteria for selection of data, man-machine communication, means for distribution and publication, indexing and abstracting, concept formation--each of these and many more were intertwined with each other and with the problems in equipment design and utilization with which I was concerned. Some of them--how to organize files and retrieve from them, in particular--I felt were clearly solvable; the developments since then have generally confirmed that. Others--language translation being the most representative example--I felt were not readily solvable, and again the experience since then has confirmed that. But all of them were important foci for research and, I felt, for education.

There were very few university based educational programs underway at that time even in computer science, and almost none in this as yet undefined field of "information science." In fact, the only one that I can think of was at Western Reserve University--the Center for Documentation Research, under James W. Perry and Allen Kent. Since I have always been highly oriented toward education, even when I was in industry, I felt that there was a need here that called desperately for formal courses. During the year or so after my conversation with Mort Taube, therefore, I tried to formulate the structure and content of a course, and then suggested it to my friends in Engineering and Mathematical Science Extension Division at UCLA. Since I had been giving courses for them in computer applications, numerical analysis, and general mathematics for many years, there was a basis for discussion, and a course on Information Storage and Retrieval was presented under their auspices for the first time in 1959. It was given subsequently over a dozen times at UCLA, American University, the University of Washington, and elsewhere.

Now, this anecdotal, historical background has significance to this paper; it is not simply the random ramblings of someone thinking about the past. The thing I want to point out is the fact that I came to this field from the computer field, concerned with the problems in applying that technology to information handling, and that the courses I first taught were under the auspices of those concerned with the technology.

But at the time I had the view that librarianship had as much, or even more, to contribute to the computer field than vice versa. I felt that if computers were effectively to be applied to large-file problems, the technologists needed to know what the librarians had learned. That view was, to say the least, counter to the attitudes of virtually all of my own professional colleagues in the computer field and, even more distressing, to the apparent views of librarians. It would have been easy to go with the obvious trend of developments and to regard information science as a focus of research totally divergent from librarianship.

It's not completely clear why I chose the path I did, although in retrospect I can identify a number of reasons that were more or less conscious at the time. First among them was the view I've already expressed, namely that librarians had developed, over a much longer time than the computer specialists had even existed, a degree of expertise in handling large files (i.e., libraries). That expertise would have direct applicability to the use of computers for the same tasks, and the technologists therefore had much to learn from the librarians, rather than duplicating the tortuous learning experience. Everything that has happened since I first had that view--over twenty years ago--has substantiated it. The successes in the data base retrieval area are due primarily to the involvement of librarians with library expertise in their development.

Now, I don't claim--and I don't believe--that librarians have the only wisdom. I think each participant in this process has much to contribute to the others and much to learn from them. The crucial point as far as I am concerned is that there be reciprocity, a recognition that each does have something to contribute.

A second rationale was the view that libraries are well managed institutions, providing excellent services, valuable services within the limits of highly constrained resources. Again, I realize that this view, which I also have had for over twenty years, is not universally held, but I think we are beginning to see concrete evidence of its truth.

The point is that information activities, whether library based or technology based or both together, must be efficient. As a frugal man, I am committed to the view that resources must be managed very carefully, milked for the maximum they have, not squandered. The library functions in that way, but much of computer technology has not yet had to do so. When the time comes, as I think inevitably it must, that the technology must be fully as efficient as the library, there will be much it can learn from the practices of the library.

The third rationale was based on the view that, at some time, the development stages--the ones of real interest to the technologists--would be completed. Who then would run the shop? Who then would be responsible for the mundane, day-to-day operations and management, the tasks with little glamour, but so necessary for successful service? Again, it seemed to me that the entire motivation of the technologists was at odds with the needs in eventual operation. Who then is going to manage an information enterprise, once it has been created? Not the system designer, not the engineer--but maybe the librarian. Who is going to do the indexing, abstracting, cataloging? Not the computer programmer, not the technical specialists--but perhaps the librarian. Who is going to provide the intermediary between users and files, the reference specialists, the human points of access? Again, not the technologists, but perhaps the librarian.

The point is that operational service requires a commitment and an expertise very different from that which characterizes the systems analyst, the engineer, or any other of those who are most deeply involved in the development of systems. But the librarian has historically shown exactly that kind of commitment and expertise.

A fourth rationale, one which has been fully as divergent from the views of the technologists as any of the others I'm listing, was based on the view that whatever the virtues of technology might be, the printed page is still a highly efficient medium for distribution of and access to information. I believed then--twenty years ago--and have stated repeatedly since then, that libraries will be around for many decades to come. That means that the proper design of systems involving both libraries and technology was essential, but that it would require extreme care in design to accomplish that objective. I firmly believe that librarians are rightly conservative, not simply fearful or recalcitrant. They see technology not as an ogre but as an unproved dream, with great problems, with the potential of diverting resources from the very limited ones available to librarians without comparable return, and with real risks for very minor improvement.

I say rightly conversative because unless very carefully managed, the entire technological dream could become a nightmare, in general as well as for any specific library. Given this general view, I have long felt that we needed a process of education so that those who would be in the library, those who would be responsible for the operations, those who would bear the burdens of failure--that they would have the knowledge on which to evaluate whether and when automation would be appropriate.

I think that process of education is now nearly complete. A generation of librarians is now at hand with the technical knowledge as well as the operational commitment. I think the result will be a dramatic, though still conservative increase in the effective use of automated tools in the library. The fact that we have moved so far in accomplishment of this makes it clear that many, many others recognized these same rationales and perhaps others as well. They similarly made commitments to combine the best of both worlds.

What is Information Science

So I'm talking about a combination of librarianship and technology as a focussing of joint work on education for what we call "information science," a combination in which each participates equally and each gains from participation. But still, what is information science?

That question is asked so often, and there are so many divergent answers to it, that I feel uncomfortable even raising it. But raise it I must, because it is crucial that we know what the educational objectives are. At several times in the past, I have provided my own answers to that question--and I emphasize the plural, answers. Specifically, in the Handbook of Data Processing for Libraries (first edition, 1970), I defined information science as:

> "the study of information producing processes in any information system in which they may occur."

Although that definition begs many others (what is information, and what are information systems), it provides a useful starting point in the sense that it recognizes that there are many different kinds of information systems as well as many different kinds of "study." There are computer systems, computer-based systems, information centers, libraries, social and biological systems--each of which can be regarded as an information system. And one can "study" them theoretically or pragmatically (as in designing new, improved systems).

For a variety of reasons, programs for education in information science have taken diverse paths in dealing with this mix of contexts. Some programs have focussed on the computer and have merged information science with computer science; some have identified it with communication theory; some have focussed on the design of systems to meet specialized needs in medical care, corporate management, command and control, etc.

But, for obvious reasons, the education of librarians as information scientists has generally focussed on the relationship of information science to librarianship, and usually with emphasis on the roles of computers in libraries and in library related retrieval. As a result, while the more theoretical approaches to information science are clearly important and valuable, the library schools have tended to focus on the pragmatic. In what I will say, therefore, this kind of focus will be emphasized, since I think that it characterizes the present situation with respect to education of librarians as information scientists.

Before so limiting the discussion, however, I think it is important to consider whether library schools shouldn't move beyond this limit in their approach to information science. Shouldn't schools of library and information science incorporate the more theoretical approaches, the broader scope of contexts, the greater objectives both academically and in the world outside academe? Shouldn't the doctoral programs in these schools, at the least, provide the kind of theoretical orientation that information science, as an abstract discipline, should represent?

These are views with which I completely agree, and my answer to those questions is a wholehearted, YES. But, there is a difference between what the library schools may do in these respects and what is involved in the education of librarians as information scientists. The preparation of professionals is one thing: of theoreticians, quite another. Library schools may well have doctoral programs and I would expect them to be fully the equivalent of any other academic program in the depth and breadth of theoretical work done. I am therefore consciously and deliberately restricting my attention to the professional preparation of librarians (the MLS program objective) as information scientists, and I'm leaving aside the more theoretical objectives. In fact, those objectives for theoretical programs ought not to be that much different in library schools from the same objectives in any other kind of information science program.

Substantive Content

So I'm focussing on the role of information science in the education of librarians, as professionals, and the first issue must be what that means, substantively. What should librarians in general know about information science? And what more should they know if they are to function not only as librarians but as information scientists? That is, is there a substantive difference in the curriculum for teaching librarians about information science and teaching them to be information scientists?

In my experience and my observations of how library schools in general handle information science within their curricula, the answer is clear. There is a difference between giving the general library school student knowledge about information science and making them specialists in information science. In the chapter of the Handbook of Data Processing for Libraries in which I discuss "information science in librarianship," I made a clear distinction between library oriented curricula, and theory oriented curricula. The following figure, copied from that book, summarizes the courses that might be included in one or another of them and the emphasis each would place on those courses.

The column labelled "Library Oriented," in particular, identifies the courses that I expected the general library professional to take that were either focussed on a topic central to information science as such or which should contain a significant element on information science. This almost exactly describes the extent to which students at UCLA/GSLIS generally learn about information science. In particular, automated systems are now an integral part of the standard courses on reference and cataloging, courses required of all students. Although we do not have a course on information center management, the one on management of libraries, in general, includes some material on automated systems in libraries and the problems in their management. The School's course on "data base retrieval systems" (emphasizing the use of the commercial data base services), while not required for all students, is being elected by virtually every student. All of the other courses, with one exception, are highly recommended to all students, although not necessarily taken by them. The one exception is "computer programming," which is not recommended, but rather is required as a prerequisite for admission to the School (although the admission requirement may be waived, subject to completion of it within the first year).

The column labelled "Systems Oriented" identifies those courses I expect the library school student specializing in information science to take, and it closely approximates what such students in general do take. They certainly all take the courses identified as "required," and they usually take those identified as "recommended."

Now, I recognize that course titles are barely descriptive, at best, of the subject content actually provided, but this paper is not the place

Figure 20.10 Various course emphases.

Representative Courses	Curricula Theory Oriented	 Computer Oriented	 Systems Oriented	 Library Oriented
Formal Disciplines				
Calculus	Pre-req.	Pre-req.	Pre-req.	–
Programming	Pre-req.	Pre-req.	①	2
Symbolic Logic	①	①	3	–
Recursive Functions	①	①	3	–
Linguistics	①	2	2	–
Applied Disciplines				
Statistics	3	3	①	–
Operations Research	3	3	①	3
Psychology	2	3	–	–
Information Theory	①	①	3	–
Systems Analysis	–	3	①	2
Methods of Social Research	–	–	2	–
Computer Oriented Courses				
Computer Hardware	3	①	2	3
Compiler Construction	3	①	–	–
Data Base Management	3	①	①	2
Information Retrieval System	①	①	①	①
Management Information System	–	3	2	–
Management Oriented Courses				
Managerial Accounting	–	–	①	3
Organization Theory	3	–	2	–
Information Center Mgt.	–	–	①	①
Service Oriented Courses				
Sources of Information	–	–	2	①
Catal., Class., Index., Abst.	2	2	2	①
Documentation	–	–	2	①

Pre-req.	Pre-requisite
①	Required
2	Recommended
3	Elective

in which to provide course outlines or syllabi. I must leave the reader to fill in the content appropriate to the objectives that are suggested by the course titles.

The Problems

I want to turn to the problems involved in accomplishing either of the two objectives (i.e., giving the student general knowledge about information science, on the one hand, and producing specialist librarians as information scientists, on the other). There are three general categories of problems that I will discuss: (1) student background, (2) time, and (3) integration.

Student Background. In any of its definitions or contexts, information science is a highly formalized discipline. In fact, in one way of looking at it, the very purpose of information science, the thing that most characterizes it, is the formalization of information processes. It therefore must draw heavily upon the tools of mathematics, of symbolic logic, of structural linguistics, and of computer programming. And there we have the first and perhaps the most overriding problem faced in dealing with information science in the education of librarians.

It is a fact of life that library schools draw 80% to 90% of their students from the humanities and social sciences (and the non-quantitative social sciences, at that). They are all highly literate, but they are abysmally non-numerate. They come with an active aversion to quantitative methods and even to the very essence of the process, the analytical approach. They typically lack the essential background required to deal with formalized methods; they lack mathematics or any of the other formal tools.

This problem complicates the education of librarians in information science in virtually every respect. It reduces "introductory courses" to a trivial level or else devotes unconscionable amounts of time to giving the students tools that they absolutely need if they are to deal with concepts, not even to consider the practice.

For example, it's essential to be able to express many relations in information science by matrices and then, for that to be meaningful, one must be able to draw on linear algebra, at least, to show the consequence of such representation. But the very concepts of a multi-dimensional space, of a vector, of "distance" are all so foreign to the student that the teacher can deal with them only at the simplest level. As another example, it is crucial to be able to discuss measures of effectiveness and criteria for optimization of them. But to do so effectively, the student needs to have some concept of differentiation, so that the criteria for optimization can be derived and interpreted. The list of these examples could be continued, all with the same result: Any essential concept in the information science component of the curriculum requires background and understanding that the vast majority of the students simply do not have.

What's the answer? Basically, there is none. We will continue to draw students from these backgrounds and with built-in aversions to formal methods. And there will not be time within even the most generous MLS program to fill in the necessary background, not even to consider re-orientation of viewpoint. However, there are some things that can be done as bridges. First, at UCLA we specify, as admission requirements, that the entering student must have taken a college course in statistics and must demonstrate knowledge of a (compiler-based) computer language. (These are as additions to the traditional requirement of a foreign language). If we were to strictly enforce those requirements, unfortunately, we would eliminate over half of our candidates for admission and about half of our actual admissions. For that reason, the requirements may, at the

Dean's discretion, be waived but they must be completed within the first year of residence in the School's program.

Aside from that, we are trying to encourage students to take courses, such as managerial accounting, that will be both of value in their subsequent careers as librarians and of value as pedagogical introductions to formal methods. We have not yet done so, but I expect that fairly soon we will introduce self-instructional aids for specific topics, to provide the students with means for building up the background needed to understand concepts that can then be presented at not so trivial levels.

Time. The second problem is much simpler to solve, and I feel that we have done so at UCLA by adopting the two-year MLS program. It's the time required to encompass information science within the curriculum, both as a general introduction and as a specialization. Let me give some perspective on the nature of the time problem and some history on the stages through which we have gone in trying to solve it.

The nature of the problem is, I think, evident: Information science adds a whole new dimension to the curriculum. It adds new courses, new prerequisites, experience and training with new kinds of library and information tools. By its nature it demands an analytical or research orientation that is time-consuming. The best pedagogical approaches to the teaching of it place even more demands upon the time of both faculty and students. Even if, as I think is the best way to incorporate information science into the curriculum, the bulk of the instruction in it is incorporated into the basic professional courses in cataloging, reference, and management, that simply increases the workload on those courses, the time that they will require, the additional time the student needs to assimilate the new material as well as the traditional.

When I first joined the faculty of the School of Library Service at

UCLA sixteen years ago, I had the responsibility for incorporating the new information science components into the curriculum. Doing so for the general student in librarianship was fairly easy--a rather superficial "introduction to information science" was about all that most of the students were willing to consider at that time, and a couple of courses on "information system design" and "information retrieval systems" met the needs of those students in librarianship who wanted more substance. I don't want to sound flippant by expressing it in this way, but the facts at the time were that there was little, if any, interest on the part of most students in either automation or in formal, theoretical approaches to their chosen field of work.

The problem was to provide those students who wished to specialize in information science with enough substance to make it meaningful. And it was simply impossible to accomplish that within the framework of the standard one-year MLS program. In fact, even if the student were to forego all of the courses regarded as essential preparation for the MLS--reference and cataloging, in particular--there was no reasonable way to develop the technical tools required for information system design or for the development of information retrieval systems within one year. There were too many courses in theory, in computer science, in management, in systems design, in operations research that were essential.

It was this reality that led to the implementation of a new degree program within the context of the library school--a "master of information science (documentation)" degree. In institutions other than UCLA, that program might well have served as the focal point or nucleus for a major inter-departmental, multi-disciplinary degree program, one that would have brought together faculty from diverse parts of the university. Certainly, that was what happened elsewhere, for example, at Georgia Tech.

At UCLA, however, there was a long-standing tradition of innovation in areas of computer development, including things that today we would term "information science." The program in the library school was thus simply one among a number of parallel academic programs--in computer science, then a newly burgeoning discipline, just beginning to achieve academic respectability, in management, where a program in "management information systems" was emerging from those faculty concerned with computer applications in business, in linguistics, in the school of medicine, in psychology. In fact, it was the rich array of parallel academic activities that forced the unfelicitous parenthetical "documentation" to be included in the name of this new degree.

The reason for the new degree, not to replace the MLS but to serve as a parallel degree track within the library school, was to permit the design of curricula with a longer time, a greater array of courses, especially in other schools and departments, and a focus on research and independent study that could not be encompassed in the one-year MLS degree time schedule. The results were, I think, an academic success, although the number of students who chose this degree program never was more than five or so per year. The graduates have all done well, although few of them found their careers in libraries. The opportunities in industry were just too many and too rewarding. Further adding to that, however, was the fact that the library community universally refused to recognize the MSIS degree as the equivalent of the MLS, despite the fact that the students took most of the courses required for the MLS, as well as those required for the more technical aspects of information science work. To say that that was a personal disappointment barely describes my own feelings, and when the University of California Libraries in particular decided that MSIS graduates were not "professional librarians," my distress became acute.

Fortunately, the academic success with the MSIS, combined with a number of other developments such as a succession of changes in the academic year of the University, led the School to consider and ultimately to implement a fundamental change in the MLS program. The decision to go to a two-year MLS program was not easy nor was it universally applauded. But the MSIS had shown it was possible and had provided an example of the kinds of specialized programs that could be encompassed in a two-year schedule. In addition, the School's experience with a couple of other specialties--bio-medical librarianship being the most successful--had demonstrated the value of more academic substance, of internships, and of self-directed research. Shortly after the transition to the two-year MLS program was completed, it was evident that the MSIS no longer served a valid purpose as a separate degree, since everything needed for it could be accomplished by handling it as a specialty within the new, two-year MLS program.

I have reviewed this history in some detail for several reasons. First, to point out some of the issues related to the requirements for additional time in an academic program that is going to provide anything more than the most superficial of competence--whether in information science or in any other major specialty within librarianship. But second, to provide an example of academic development in this field against which others can be compared. For example, the Georgia Tech program has become a focal point for virtually all of the information systems academic work on that campus; the program at the University of Pittsburgh has resulted in two clearly distinct tracks, one in librarianship and the other in information management; the one at Ohio State has become closely associated with the computer science field. In contrast to these, the program at UCLA has become assimilated into a new structure of education for librarianship, in which information science is simply one of the specialties.

Integration. It is this contrast which brings me to the third set of problems: How does one integrate information science into librarianship, and vice versa? As I indicated much earlier in this paper, my basic motivation from the beginning of my involvement in education in this field was the view that technology and librarianship has much to learn from each other, but that they would do so only if there was a framework of reciprocity, a context of mutual respect and acceptance, a working together rather apart. This basic motivation probably had more to do with the path of progress in our program than any other single thing. It created a climate in which joint resolution of academic issues was encouraged, and I think it was a major part of the decision to "bite the bullet" and go to a two-year MLS program.

Of course, efforts to integrate two approaches so dramatically different in style as librarianship and information science are not necessarily successful nor are they carried out without conflict along the way. There are differences in attitude of faculty--and of students; differences in means of instruction, in emphasis, in demands on the students; differences in time sequence of course work; differences in the relative value of internship or experience versus research or independent study. None of those differences is easy to resolve, and some schools I understand have not been able yet to resolve them. In such cases, the information science component will exist as an independent entity, with minimal interaction between it and library education, or as an indigestible lump, a source of continuing acrimony and conflict.

Even in those cases where assimilation has not clearly been effected, however, I suspect there has been a de facto assimilation, in which the methods of information science have gradually been accepted and incorporated into those courses in librarianship that clearly need them. The result may not be an integration of information science as such into the curriculum, but it is an effective integration of the tools and techniques where they are essential.

What I have in mind is the gradual incorporation of experience with on-line cataloging services into the courses on cataloging, the incorporation of search strategies for use on on-line data base services into the courses on reference and bibliography, the incorporation of mechanized library systems into courses on library management or technical processing. Since these have all occurred in our program at UCLA, I must assume that they are occurring elsewhere as well. Frankly, at this stage in the history of librarianship, it's inconceivable to me that any accredited library school has not achieved at least that level of assimilation of information science into its curriculum in librarianship.

But the much deeper integration, in which theory in the two components is synthesized into a greater whole, in which information science as a speciality is treated as completely parallel with other specialties, in which faculty and students together apply both sets of concepts and methods with facility or at least in cooperation rather than isolation--that integration requires a far greater degree of mutual respect and cooperation.

The Means

As I have tried to show, education for librarians as information scientists has required that we deal with many problems. In one way or another, I think library education has done so. I now want to turn to a second set of issues related to the resources needed for education of librarians as information scientists and the methods of instruction appropriate for it.

Resources. The past ten to fifteen years has seen a dramatic and continuing increase in the number and variety of resources available for instruction of librarians as information scientists. I think back to fifteen years ago, when we started and could talk only in hypothetical terms or with the most primitive of data bases. While computing power may have been more or less readily available, the software needed certainly wasn't; the retrieval packages were still in the process of being developed; the data management systems were of marginal applicability; the data bases from ERIC, from NLM, from Chemical Abstracts were just beginning to become available. And frankly, speaking for myself, I was just beginning to learn what the real problems were as I tried to translate theory into practice.

Of course, we saw at that time a number of developments on university campuses--I think especially of the center at the University of Pittsburgh, under the direction of Allen Kent, because it was the first, but I think as well of the one at UCLA because it's the one I know best. They provided contexts in which the educational programs could gradually gain more substance and reality. There were tasks in design and development in which the library school students, both in general and among those specializing in information science, could participate.

But today the wealth of resources is so great that the education of librarians as information scientists can be given in the context of reality. First, virtually every school of library and information science now either has mini-computers and micro-computers among the equipment directly under its control or it has ready access to them. This means that students have a degree of hands-on experience that cannot be obtained in any other way. It is easy to assign programming tasks that are meaningful, that can be carried out by individual students or small teams of them, that create experiments or operational prototypes on which the students can learn even more.

Second, a wealth of retrieval packages and data base management systems are now available and operational on virtually every major university's campus computing facility; statistical packages, such as SPSS or Minitab, are readily available everywhere. As a result, meaningful classroom exercises, student research projects, and faculty research can now be readily carried out.

Third, data bases of all kinds--reference data bases, statistical data bases (such as the US Census), numerical data bases, even text data bases--are readily available. It is easy to acquire either whole data bases, at very nominal costs, or samples of a size large enough to support instruction.

Fourth, and perhaps most direct in its effect, is the availability of the several on-line services--the cataloging services, the data base services, the statistical data base services (with their associated modelling capabilities). Generally, these have been willing, even anxious, to make their services available at nominal costs for instructional purposes. The result is that the students can gain experience that will be directly applicable to their later work as professional librarians. But in the process they gain an awareness on which their understanding of the theoretical concepts and design issues can be based.

Methods of Instruction. Let me turn now to the methods of instruction appropriate to education of librarians as information scientists. To an extent, they are the traditional ones--lectures, seminars, exercises, case studies, research tasks--and it's clearly not necessary to review them as methodologies. I'm not going to do so, but I do want to comment on the changes that have occurred over the past fifteen years, primarily as a result of the growing availability of resources.

Fifteen years ago, my instruction was based on lectures, with quite limited assignments. Only a few students were interested in more than that, and the magnitude of problems in providing contexts for more substantive instructional methods was enormous. By ten years ago, however, there were a sufficient number of data bases available that meaningful assignments could be made, and I began to develop sets of case studies to serve as design problems. Today, with the rich array of resources--hardware, software, and data bases--the instructional methods are limited only by the imagination of the teacher and the students. Training tools, designed to run on computers at all levels of size are readily at hand; development tasks can be assigned in a context of existing capabilities that make them feasible and within the capacity of the individual student; research problems can be identified with knowledge that the data necessary to explore them can be readily obtained--data such as frequency counts within data bases, citation counts, utilization statistics, etc.

The Opportunities

I want to conclude the substance of this paper with a review of the opportunities, as I see them. I don't think my viewpoint is particularly unique or, at this stage, revolutionary. Frankly, it's a view that I think every school of library and information science in the country now holds, or at least professes. It's the view that there are opportunities for graduates of our program in a world much wider than simply those institutions specifically identified as "libraries." Whether we use the term "information manager" or some other alternative, these positions are seen as ones for which the librarian trained as an information scientist is qualified.

In what way does this kind of education prepare the graduate for such work? What makes them better candidates than graduates of a computer science program, or a school of management program in management information systems? I think there is an emphasis that is imparted in the education of librarians as information scientists that is significantly different from that given by any other kind of program. It is the emphasis on information as a resource and on the values in providing services based upon it. In contrast, the programs in computer science tend to focus on the hardware and software--the means rather than the substance of the information they handle. On the other hand, the schools of management tend to focus on the needs for information, the management contexts in which information may be of value; they emphasize the use of information derived from the operations of the organization, rather than those available from outside it.

Today, we are experiencing a major revolution. Daniel Bell first characterized it when he referred to the "post-industrial" age; Fritz Machlup tried to measure it when he identified it as the "information age"; and most recently, Marc Porat has shown that it is a major force in our economy, and he calls it the "information economy." Today, nearly 50% (perhaps even over 50%) of our work force is engaged in information work. It pervades every sector of our economy, every industry. Half of it is within the operations of companies of all kinds--and those include, in part, the management information systems. But half of it is an industry itself, selling information products and services. It is in this area especially that the information professional, the person with information science background, has opportunities. The librarian trained as information scientist is in that respect uniquely qualified to provide the professional services involved in acquiring information, packaging and selling it, providing access to it, designing systems for doing all of those things, managing the staff and the enterprise that provide those services. The librarian educated as information scientist is especially qualified to function within organizations that acquire and use information as a capital resource by providing the professional expertise needed to evaluate the role of information, the technical knowledge required to make the information accessible. It is these opportunities that are now being identified but that will increase in number and importance as industry discovers information as a crucial tool in improving productivity, as a means for more effective product design, and as the basis for better marketing.

The Issues

The invitation to write this paper identified a number of issues that, among others, ought specifically to be included in it. I want to be sure that they indeed have explicitly been covered, so I will review each of them.

In what ways has education in information science undergone changes in the past ten years? I think I have quite explicitly dealt with this issue, but to summarize: It has become much more concrete rather than hypothetical, much more specific to the basic competencies of librarianship (i.e., cataloging and reference work) rather than distinct from them, much more meaningful and germane to real applications in its theoretical aspects.

Are teaching methods changing? Clearly they are. With the availability of better resources, the teacher can be properly much more demanding of the student and provide the student with more meaningful experience than is given by the best of lectures or hypothetical discussion.

For what kinds of work are students being prepared? The range of work opportunities provided by the information science component of education for librarianship is both richer and deeper than ever before. First, the work of the professional librarian now requires, in cataloging and reference and management, a degree of expertise in information science. Without it, the graduate today would have a major handicap in competing for work and in performing the work effectively. Second, new opportunities have opened up in libraries in the form of library systems analysts, on-line searching specialists, managers of automated library systems for which information science is the essential prerequisite. Third, a whole new industry now exists, providing information services of all kinds, that needs the professional preparation represented by education of librarians as information scientists. Fourth, in organizations of all kinds--industry, banking and insurance, government agencies, etc.--there is an increasing recognition that information is an essential tool and that people are needed with the qualifications, the technical expertise to control the flow of information, to manage the information resources, and to make information available when it is needed. Finally, there is a continuing need for people with the theoretical background in information science needed to deal with the new problems in this field as they arise and to move into research and teaching in academic environments. While the Ph.D. is still the essential means for entering the academic world, information science is an ideal basis on which to develop Ph.D. qualifications. It integrates into a single discipline a diversity of tools and methods, and the research problems are of major importance.

What kinds of changes are taking place in faculty? Today, a new generation of library school faculty is at hand, a generation with competence in information science, and some of that generation is committed to information science as the focus of their academic work in library schools. The recent appointments made on my faculty at UCLA have all had real competence in this speciality, and some of them are deeply involved in it as the focus of their own teaching and research. Beyond that, the faculty, in general, is now cognizant of the impact of information science and receptive to incorporating it properly into the curriculum.

Are faculty keeping up with current changes in the profession? That clearly varies from individual to individual and institution to institution. But speaking only for my own faculty, the answer clearly is yes. And they are actively engaged in making some of those changes themselves.

Where are future educators coming from? How and where are they being trained? The picture I have is that the first generation of information science educators came from outside the field of librarianship. They were drawn to information science as pioneers, coming from diverse fields--chemistry, mathematics, psychology, physics, computers--but converging on a common focus of interest and, in many cases, identifying the library school as a suitable academic home. The past ten years has seen a steadily increasing flow of the second generation as graduates of Ph.D. programs in library schools with information science components who have a commitment to information science education and research. Although library schools will continue, as they historically have done, to draw a fairly high percentage of faculty from outside of the library profession as such, I think we will see that most of the information science faculty in library schools will now be coming from the library schools themselves.

Are there two kinds of faculty--technology oriented and non-technology oriented? Without question, yes. There are and will continue to be faculty whose focus is on the literature, on service to specific population groups (like children, the handicapped, ethnic groups, etc.), on history and history of the book especially, on reference as a book-oriented service. None of these by its nature is technology oriented, nor should it be. On the other hand, some faculty are deeply concerned with the management of technology, with the theoretical and practical problems involved in utilizing it, in the study and solution of the research problems posed by technology.

The real question is not this one, but rather the following: Do the two groups see themselves as distinct and, more to the point, at odds with each other? That's much more important and difficult to answer. It obviously depends upon the interpersonal relationships within each faculty. I can therefore answer only very personally. At UCLA, there are residual "camps," but more in the nature of a continuing friendly rivalry than a serious conflict. In fact, many of those who would be most identified with the non-technology focus, who would have little or no interest in information science as their own area of research and study, are among the heaviest users of the computer as a tool in their own research work.

More generally, we might also ask whether there should be two kinds of faculty, and I think the answer is a resounding yes. It is the creative tension of diverse interests, even conflicting ones, that makes for a rich intellectual environment.

How does the curriculum in library school change (as a result of information science additions, I assume)? The most important change, I think, is the forced increase in the length and academic content of the curriculum. Information science cannot simply be added to the curriculum within the same time frame that library schools generally have had without serious degradation in all of the components. As I have tried to show in this paper, this was one of the elements uppermost in making the decision at UCLA to go to a two-year program.

Beyond that, however, integrating information science into the library school curriculum requires that the entire curriculum be rethought. What parts of information science should be included with the coverage of the basic courses in librarianship and what part should be placed into new courses? What should the new prerequisites for admission be so as to assure that the students can deal with the concepts and methods of information science? What should the role of research be, both in general and specific to information science, in the education of the librarian? These kinds of questions must be answered and the result is likely to be fundamental changes in the structure of the curriculum.

What kind of time lag is there between changing needs in the profession and curricular change? I don't think there is a significant time lag. People in library education are fully as aware of the changes taking place in the profession as those who are practicing in it; they are fully as ready to adapt the curriculum as may be appropriate to accommodate those changes. On the other hand, faculty are properly conservative in reacting to changes, and they are reluctant to sway with every breeze that wafts through the air. That conservatism may result in some changes in the curriculum occurring significantly after the time when the practicing professional may have felt a need. On the other hand, the practicing professional who feels a lack is probably viewing it in the context of library education when he or she was receiving it, ten or twenty years earlier, rather than that of today.

How do decisions to change (the curriculum) come about? That varies so from faculty to faculty, from institution to institution, that it's really impossible to say. At UCLA, we have a policy of continuing review of the curriculum each year, using a joint faculty-student committee as the means for carrying out the examination. Then, periodically (every two or three years) we have a formal programmatic review at which a major change in the curriculum will be considered. One such review led to the crucial decision to change to a two-year program; other programmatic reviews haven't been that dramatic but they have resulted in significant changes.

Summary

This paper has been a highly personal response to the request for my observations, beliefs, and reflections concerning education of librarians as information scientists. As such, it has been based on my own experience, with only passing attention paid to what others may have experienced or have done. I have tried to give a picture of my own biases, my own philosophical orientation. I have presented a definition of information science and a description of the substantive content that I think a curriculum in information science should have. I have reviewed a number of problems involved in implementing that kind of program within the context of a library school, as well as the status of resources and means for dealing with those problems. I have presented what I think are the opportunities for graduates of schools of library and information science that have opened up in large part because of the information revolution in which we find ourselves. Finally, I have tried to be explicit in dealing with a number of specific issues raised as relevant to this topic.

In reviewing what I have written, I'm uncertain about the extent to which it meets that need for which it is intended, but I can say one thing: It is a coherent whole, providing a picture based on one person's views that is internally consistent. I think there is value in that kind of picture, if only to provide a framework within which others can evaluate their own personal views.

Some Reflections on Library Education by a Public Library Administrator

John H. Rebenack

In a period when most of our basic institutions, including libraries, are under assault by the forces of change, public library administrators place certain responsibilities to the profession on library educators. How well they fulfill these responsibilities is most evident in the product of library schools--the young librarian. This paper deals with one administrator's impression of the ways in which library education has changed relative to changes in the library environment and some thoughts and reflections on ways in which it ought to change in the future. The future of the public library depends to a significant extent on the capabilities of young librarians who will be faced throughout their careers with the demand to respond to the challenges imposed by successions of rapid and fundamental changes. What library schools are doing and planning to do to prepare the corps of new professionals is, therefore, of vital concern to public librarianship.

Change Affects Libraries and Library Education

There is reason to believe that a policy statement formulated a decade ago for library education has become the basis for the training now being given the library school student. The impact of that statement on current library education seems more evident and necessary now than ever. It said in part that:

> The objective of the master's program in librarianship should be to prepare librarians capable of anticipating and engineering the change and improvement required to move the profession constantly forward. The curriculum and teaching methods should be designed to serve this kind of education for the future rather than train for the practice of the present.

If this statement had had the impact on library education one would think it ought to have had, library school faculties would be promoting a fifth year master's program designed to change the status quo in librarianship. Nearly all the evidence seems to point toward the assumption that library schools have made a determined effort to achieve the stated objective.

While library educators were attempting to respond to change and deal with its impact on librarianship, alert administrators were also aware of the winds of change shaking the status quo in the local public library environment. There were many forces at work in libraries and communities that were altering the administrator's role, management style and outlook on traditional library services. The paternalistic management style of the typical administrator, the middle class image of the community library, and the continuation of service developed and geared to the assumed needs of earlier generations were among the traditions under attack. The need to adopt management by objective, respond to the demand for fiscal accountability, develop outreach programs for the economic, socially and educationally disadvantaged, initiate information and referral services for environmentally remote people, to name only a few, are compelling reasons why administrators must look critically at conditions in their aging institutions.

If public librarians were (and are) bewildered by "future shock", library educators were probably equally bewildered.

Many of the better concepts for implementing change for the improvement of library services to come out of the ranks of professionals were stimulated by coalitions of administrators, library staff and educators. Each had an impact on the other, but it strikes this writer that educators' positive responses through their contributions to library literature improved the ability of the professional to state the problems and move with some assurance toward tentative solutions.

High quality librarians are needed to carry the work load of public libraries, stressed by rapid societal changes. Library administrators, it seems, would have reason to be confident that today's educators are preparing students to be forward-looking professionals, capable of anticipating and dealing with change. Administrators need to be more than vaguely aware of what is happening in library schools. They need to continually reshape impressions through exposure to three rather obvious points of contact with library education: direct communication with faculty members, reading faculty contributions to library literature, and involvement with recent graduates of library school master's programs through employment interviews and, after placements, through observations drawn from daily staff relationships and performance reviews.

Educators Address Change in Research

Much that has happened in library education in recent years has been discussed in library literature. The ideas and concepts developed by faculty members have had a positive impact on the public library environment. For the most part, results of intensive research, new concepts explored in some depth, a search for improvements in library services, and, of course, advances made in education for librarianship can be found in professional library education writings.

An overall impression one receives is that the majority of library educators are contributing to librarianship equally as leaders of innovative thinking and as teachers of students in the master's program. Administrators and staff members who keep abreast of the flow of professional literature are likely to detect an influx of ideas and concepts reflecting an overview of the library environment generally, challenging entrenched viewpoints and eventually altering or coloring decision-making. A few very recent examples are Thomas Galvin's "Libraries to Serve the Information Society" (Library Journal, September 15, 1979), Ralph Blasingname's "The Public Library and Information Policy" (Library Journal, September 15, 1979), and "Trends in Public Library I & R Services" by Thomas Childers (Library Journal, October 1, 1979). An observer may assume, correctly it is hoped, that faculty members who are involved enthusiastically in research and writing and who stir the thinking of practicing librarians will have a positive impact on the minds and outlooks of the students in their classrooms, stimulating them to become active and forward-looking in their careers.

At the same time, not all faculty writers, as one would expect, are effective in their development of ideas and the sense of direction they wish to impart to their readers. Alert administrators usually detect the flaw in some writings, such as the lack of relevance to the practical aspects of public library management resulting from the writer's lean experience in the public library field. These writers assume somehow that changes in an organization can be ordered from the director's office and implemented quickly. The number of articles breeding negative reactions seem to be appearing less frequently than those receiving positive ones, or perhaps practicing librarians have grown somewhat tolerant of suggestions and ideas as they grapple with growing complexities of organizational problems, sometimes rushed or forced by rapidly changing conditions. Perhaps practicing professionals need to make the effort to respond to the writings of educators, to discuss them and work out through dialogue the differences of viewpoints and experiences rather than letting these differences fester.

Well Prepared Graduates Can Cope With Change

Regardless of the tensions, large and small, that have existed between educators and administrators, between the "theorist" and the "practitioner", the public library depends heavily on the product of the library school for its future survival. A dependence on an influx of new professionals into the field goes beyond the need for replacements to fill positions. Above all, the administrator hopes to find among the new crop of graduates, people who are not only forward-looking, enthusiastic, alert mentally, possessed of a sense of dedication to the profession and adaptable to change, to name only a few outstanding qualities, but who also have the capability and the desire to assume management roles rather early in their careers. The presence of these qualities in a graduate who also has a solid undergraduate background and who was a high achiever academically should signal a promising career in librarianship. While graduates who exhibit an appreciation and understanding of advanced technologies and who possess a multi-media orientation with respect to library materials collections-building may be useful to the organization, they are not likely to be in contention for leadership roles unless they also exhibit qualities of vision, adaptability and dedication. These are among the qualities this writer would be looking for first when interviewing applicants for beginning professional positions. Perhaps one of the most difficult qualities to assess in new librarians is their receptiveness to innovation and their ability to cope with change. The library school that prepares its students to be concerned about the future of libraries and gives them training in assessing the impact of change and how to move with it effectively may be providing librarianship with its strongest future leaders.

Graduates Still Have Limited Grasp of Change

Predicting the changes that will take place in ten or twenty years may be almost impossible, but there are sufficient indications that inroads made by on-line data bases, the electronic media in general, multi-type interlibrary cooperation and networking, and involvement in community concerns, among others, will intensify. Much has been written on these subjects and considerably more can be expected since these are among the concerns that appear to be in the forefront of librarians' thinking. It is not difficult, therefore, to predict that in the future, the community public library, in some respects, will likely be a terminal on the library and information systems network.

Library educators, as their writings indicate, are looking at the indicators of change and the developments that spawn change and have placed some emphasis on changes that are more open-ended, more productive and more responsive to the needs of a technological society in the post-industrial era. These educators should be having an enormous impact on their students, but from the perspective of a library administrator, it would seem that few students have been able to visualize the full sweep of change affecting the public library's future.

Library education needs to place greater emphasis on the importance of change itself. Educators need to stimulate students to be more aware of the need for change within the libraries they will serve. Students need to be encouraged to keep up with or react receptively to change, not only in technologies but, more importantly, in the communities that libraries serve. Public libraries are indeed in danger of falling behind when the need for renewal is neglected or unrecognized by staff. Young professionals must be taught early that the public library is, to use John Gardner's expression, an "aging institution." The kind of mental attitude that needs to be imparted to the student is embodied in a portion of a speech made by Gardner a decade ago. He said:

> I have collected a great many examples of organizations that have fallen on evil days because of their failure

> to renew themselves. And I want to place before you two curious facts that I draw from those examples.
>
> First, I haven't yet encountered an organization that wanted to go to seed or fall behind in the parade. Second, in every case of organizational decline that I know anything about, there were ample warning signals long before trouble struck. And I don't mean warning signals that only a Monday morning quarterback could discern. I mean that before trouble struck, there were observers who had correctly diagnosed the difficulties to come.
>
> Now if there are plenty of warning signals, and if no organization really wants to go to seed, why does it happen? The answer is obvious: Eyes that see not, ears that hear not, minds that deny the evidence before them. When organizations are not meeting the challenge of change, it is as a rule not because they can't solve their problems, but because they won't see their problems; not because they don't know their faults, but because they rationalize them as virtues or necessities.

Are library school students being exposed to the whole concept or theory of change, even though they are in contact with some of the most forward-looking thinkers in the field of librarianship? There should be concern that the young professional will try to fit the newer ideas and technologies into the older, established environment of the institutions they enter without first making those adjustments and changes in the institution that must precede the acceptance of new ideas. As they become leaders of those institutions, their greatest contributions may be in knowing how to cope with change, having learned appropriate skills early in their careers.

Library schools, in a broadening of their educational roles, appear to have provided the field of librarianship with a thrust toward a research and development complex. Effective communication and interaction between faculty and practicing librarians in the light of rapid change is essential. And yet, the demands of the day and the complexity of the problems, while they require from librarians more extensive backgrounds and funds of knowledge and information to devise innovative solutions, at the same time make the dialog between educators and librarians more difficult. In one respect, the rapid developments in recent decades in information processing, the growth of an information industry, and the practical applications of these developments have given administrators, without some outside guidance, almost too much to sort out, evaluate, and apply.

Students stepping into their first professional positions very often have difficulty adjusting their thinking and making the mental transitions from their expectations of librarianship to the realities of their day-to-day work.

The transition appears to be easier for the beginner who has been counseled in the art of interpersonal relations. Otherwise, this point in their careers may have built-in frustrations generated out of the friction point where youthful enthusiasm is cooled by a staff accustomed to the comforts of doing as they have always done. Worse for the library in the long run, of course, is for the new librarian to surrender ideals and enthusiasm to the status quo. Administrators who are compelled to move their organizations forward need staff enthusiasm and, at the same time, have a responsibility to involve new professionals and encourage their participation in whatever planning is being done.

Young Librarians Can Help Plan For Change

Today's young librarians usually need little encouragement to participate in the planning and development of new or improved services. At their best, they seem to possess more than enthusiasm. They also express almost a sense of entitlement to participate in the planning for future development in the community library; they seem to have little fear of the uncertainties of the future that they will help shape and, ultimately, live through. It follows, therefore, that top administrators as well as middle managers need to provide opportunities for young librarians to share in the institution's long-range planning, and, perhaps, to spread a few fresh ideas onto the local scene. Good management generally urges the development of the next generation of managers and leaders in the profession.

Recent changes in the attitudes and outlooks of young professionals have added another dimension to the concept of staff development through involvement. It now appears that not only do new professionals expect the opportunity, they demand the challenge. What a resisting supervisor is likely to hear, and perhaps misunderstand, is the plea of the young librarian for a share in "decision making." Or it may be the suggestion to institute "participatory management." What this writer has discovered is that the recent graduate is seeking opportunities to exercise skills, test judgments, expand thinking, add to experience and grow professionally--not an unreasonable outlook on the part of young people who are products of a graduate academic program that demands the best of them.

There is another side of this point that needs to be explored. Once opportunities are given to young librarians to exercise initiative, judgment, and skill and, if a test situation is presented, young people may find that their initial sureness and enthusiasm are suddenly subdued. They may become somewhat fearful and uncertain, and they make a few mistakes.

A situation in which this writer was involved turned out to be a "test case" in which a group of new librarians were given a chance to test their idealism against reality and experience. The young professionals on a library staff had exhibited a great enthusiasm for being involved in the library's planning process. It was the young librarians who developed the methods and format in which the total group functioned.

The "test situation" referred to here was in actuality not meant as a test. Rather, it was a project involving a staff committee made up of a high proportion of young professionals which was assigned the task of developing a comprehensive planning paper, outlining the staff position or point of view in response to three primary charges:

> Review and recommend changes in the library's mission statement. This revision should take into account current developments and anticipated changes occurring in libraries and communities affecting requirements and needs for rapid updating of information.
>
> Consider societal changes that tend to alter the traditional role of the public library and plot the impacts on the future courses of library development.
>
> Prepare a position paper stating, from the professional point of view, what levels of development the library should achieve in the next decade, what changes will be necessary, and how and when these changes should take place.

Several months of discussion and writing by the committee resulted in a staff position paper which, after review by the library board, set into motion targeted strategic and long-range planning objectives that ultimately will have a profound impact on the future operation and services of this library.

Working on the position paper had a profound effect on the young professionals. For some, idealisms and advanced technical knowledge gained in library school came up against such harsh realities of library administration as financial feasibilities, the enormous task of managing change in a large organization, and the uncertainties of stimulating community involvement. If this was a time of difficult reality-testing for recent library school graduates, it must be said to their credit that they were absorbent. While they offered to the process refined research skills and an almost fanatic concern for specificity in language, they learned from the older professionals that such skills are not sufficient to effect the changes they recommended. Also essential to gaining support for change were an ability to work with people, an understanding of the politics of the institution, and the judgment to know when to relax one's prodding of a viewpoint to allow others to assimilate new information. Intense interaction with older, more experienced professionals on the committee provided the young professionals with an opportunity to observe and practice less dogmatic means of promoting change.

Library Education Needs to Provide a Vision of the "New" Library

It is evident that library education has contributed to and refined the abilities of students to cope with some of the concepts and fundamentals necessary for participation in the planning, development and upgrading of services within the library. Despite their familiarity with new techniques and their eagerness to participate in library planning, however, new graduates often do not seem to envision a library of the future as radically different from the library of the present. They talk as if new technologies will be appended to present institutions, rather than fully comprehending the possibility that public libraries as we presently know them may change drastically in another twenty years.

In the past two decades, we have seen the rapid expansion in computer and communication technologies create almost instant access to information. Wherever there is an electrical outlet and a telephone line, a great wealth of information is available. It is no longer necessary to have access to the traditional, large reference collection of print materials and the aid of a librarian to manually search for information. It is difficult to visualize where the increasingly rapid pace of solid-state electronics is headed, but there are a few very recent developments that have stimulated the imagination. QUBE, Columbus, Ohio, for example, with its interactive capability of providing instant access to encyclopedic information through the ordinary television set, must be viewed as more than a fascinating gadget. It is an exciting new mode for the delivery of information, not delivered to the librarian in the library serving the public, but directly to the viewer at home. Developments are so fast-paced that Susan Cherry is prompted to say in her article, "Telereference: The New TV Information Systems" (American Libraries, February 1980), "If librarians hope to have a say in their future, they will have to 'stay tuned' to the developing home information field." She also cites experts who see the library's role as becoming more "human-oriented" as videotext and teletext gain acceptance and become more commonplace.

Systems of on-line data bases are being introducted into the public library to enhance and contribute new dimensions to reference services. It is a time of transition in which a tension exists between the young recent graduates entering the field and the older, experienced reference librarians. The new technology and its application to reference work appears in general to be better understood by the young librarian who received intensive instruction in library school in a variety of data bases. The new librarian, however, lacks the experience in the use of printed reference sources, although their education did include an introduction to these sources. The experienced reference librarian, on the other hand, has considerable knowledge of and expertise in the use of print materials, but often has little knowledge of on-line resources, having matured in the profession before the development of this equipment. Both groups of professionals need to communicate, learn, experience, and understand the complimentary natures of the two types of resources and the distinctive logics required to use both efficiently.

In training students in the fifth year program, faculties need to be aware not only of the distinctions of the print and electronic formats and the need for both in public library reference service, but also of the two levels of expertise required to make both systems work well together.

The social and internal changes that are effecting public libraries will require that we make the maximum use of all of our human resources. "The major impact of technology," as Stephen Keating of Honeywell views the future, "will be the social evolutions it creates, which, like the most fundamental changes of the '60s and '70s, will be more pervasive and less visible than our hardware." Even if this statement were only partly accurate, a difficult question facing the public library is how will it meet new challenges and keep pace with societal changes. It seems imperative that young librarians be trained to grapple with questions related to human responses to technological change. The kinds of responses that libraries make to the needs of users will greatly affect the library's future role and the work of librarians. There should be great concern among library educators and public librarians that the library school curriculum and its teaching methods be injected with more intense interdisciplinary studies in the behavioral and social sciences. These studies should prepare students to deal more specifically with the concepts and problems inherent in human responses to technological advancements and the social evolutions thus created.

The events in the field and the ways in which new developments affect libraries and the work of librarians should be a large part of the substance of library education. In a period of exponential change, educators and librarians need to work together to select and sift out the specializations most urgently needed by students preparing for positions in tomorrow's public library environment.

Library Education Needs Development and Change

It has often been said that a public librarian needs to know how to work well with people. All other skills are secondary. Effective interpersonal relations is only part of the skill involved in working with people. Among the other knowledges, skills and abilities that need to be introduced and refined in the master's program are management training, personnel administration, public relations and politics. Because of the essential knowledge offered by such specialized disciplines, because of the growing evidence that every librarian emerging from the fifth year program will likely have difficulty maturing professionally without training in them, lengthening the master's program from one to two years, as some schools have already done, would expand the opportunity for students to acquire additional, useful skills to meet future job demands.

On entering the field, librarians need to have some understanding of how organizations work and how they are managed. They need to know to manage by objectives. At the very least, they need to know how to write measurable objectives, the difference being inputs and outputs, how to use statistical data effectively, and how to work with cost benefit analysis.

Training in the principles of managing personnel, in particular, is needed now more than ever. The assumption that any responsible, intelligent,feeling person can supervise staff no longer holds true. Supervising personnel, even for the middle manager or for those father down the organizational ladder, carries with it the responsibility to evaluate job performance based upon standards. Conducting performance appraisals requires that the librarian develop skills that are fairly difficult to learn, but which are essential to avoid such pitfalls as on-the-job biases that can cause trouble for any supervisor and can reduce the effectiveness and efficiency of an organization. Closer attention will need to be paid to techniques and methods of establishing performance standards, setting performance objectives and conducting performance reviews and appraisals.

Understanding and agreement between supervisor and employee are key concerns if employees are to grow and become more proficient at their jobs. The processes involved may be learned with relative ease, but practice and continuing effort are essential to make the system work well. Library educators offering instruction in these skills in the master's program can become effective coaches to whom practicing librarians can turn on a continuing basis. With their backgrounds solidly oriented to librarianship and with support from other disciplines on the campus, library educators better than others can be the primary source for intellectual development for practicing librarians. Most courses, workshops and seminars on performance review and appraisal seem to be geared to profit-making organizations. Librarians attending such seminars need to make a considerable adjustment in adapting the techniques to the public library environment.

Better known to library education is the subject of public or community relations. Some of the methods and skills involved in public relations, such as publicity, have been included in some phase of the library school curriculum for a long time. Since the public library's business is with the public, more that superficial emphasis should be placed on the full meaning of public relations in library school. Librarians should know from the outset that the library's image in the community is not created. The library already has an image. Skill and effort are required to adjust the image that the public already holds and to create a new image that represents changing public demands and changing library responses. In times of rapid change in librarianship and in the services offered by libraries, public relations becomes an important skill if the image of the library is not to be outdated. In all community-library activities and interests, it becomes the means for creating a climate for cooperation and coordination of efforts. How the library is preceived becomes a matter of real concern when the community is asked to expend larger amounts of tax dollars on library services at a time when all public institutions have justifiable financial needs. Better support for libraries cannot be gained only through salesmanship, but comes as a result of an image built on an acceptable level of service delivery. Reaching a respectable level of performance probably is developed out of one-on-one relationships. The individual staff member's performance, repeated over and over again, has a substantial impact on image building.

Library schools are certainly not unaware of the importance of image building. They do it all the time for reasons comparable to those of public libraries. The main thrust of an emphasis on public relations in the master's program should be a rather thorough examination of the relationships of this aspect of management to library operations, quality of services, staff performance, and a host of other actions and interactions that produce an image.

Another area in which young professionals seem particularly inadequate is in their understanding of politics. While they may have a general or academic understanding of the political process, a knowledge or skill in practical politics is lacking. In the first place, there seems to be little appreciation of the reality that public libraries are in the political arena at all three levels: local, state and national. Politics involves compromise, timing, patience, communication, and the working out of tensions of opposing views. These and a number of other elements inherent in political activity are generally learned as a result of experience. And experience is essential if the political system is to be exercised on behalf of libraries. It is obvious that no one should expect the young graduate to be experienced and sophisticated in such matters.

Nevertheless, the library school is the place where the developing professional can and should learn the fundamentals of politics and an appreciation for the value of the political process.

Again, a positive result of a lengthened master's program from one year or two would be to allow additional time for more specialized study and for the refinement of skills and competencies which will be required of coming generations of public library leaders. An expanded program would also provide time for students to polish some essential skills to meet immediate job requirements. Many of the skills referred to here, such as personnel management, community relations, and politics depend on a fairly mature understanding of human relations and organizations.

One of the attributes examined most closely among the qualifications of applicants for professional positions, in this writer's experience, is evidence of the ability to relate well to the public and work well with other staff persons. Additional training within the master's program would give the student opportunities to discover and overcome weaknesses and deficiencies in human relations skills and time to acquire additional experiences through additional coursework both in librarianship and in other disciplines, extensive practicums and through other related activities.

Conclusion

In summary, the observations of this writer are that library education has made some advances in response to the changing library environment. Recent graduates seem better prepared technologically to deal with future demands for informational services. The aim is certainly in the right direction. The librarian entering the field with some skill in dealing with people and with an understanding of the complexity of a rapidly changing library environment is more likely to find librarianship a satisfying career. The final test of a library school's commitment to the profession may be its flexibility and creativity in developing educational programs to meet the changing needs of public librarians in the years ahead.

The Need for Future Research on Topics Impacting Library Education

Ruth M. Katz
University of Denver

Introduction

The purpose of this paper is to suggest topics amenable to study that might produce results beneficial to library education. This already modest objective is further limited by three assumptions:

1. Research and library education are natural partners, if for no other reason than that they frequently occur in university settings and the goals of universities involve educating students and advancing knowledge. This argument has been made by the present author in her doctoral dissertation[1] and, most convincingly, by Wilson.[2,3] Both authors present reviews of the appropriate literature.
2. It is not productive to argue about whether librarianship is or should be a profession. It is preferable to say that librarianship or information science or information management graduate programs are generally regarded as professional schools and that the literature concerned with professionalism/professional education applies to them.
3. It is also not productive to be concerned with whether librarianship is based in the humanities, the social sciences, the behavioral sciences, etc.

Having assumed away some troublesome issues, it is important to note that all are researchable!

The present paper is not based on an exhaustive search of the literature. The Journal of Education for Librarianship was examined for the period 1974 through 1979, both for pertinent articles and for the record of dissertation topics accepted. This review served an additional purpose. On a purely subjective level, recent issues (1978 and 1979) seemed to have an increased percentage of excellent articles and the dissertation topics accepted by the various graduate schools appear to be more challenging and complex. Also reviewed in preparation for this paper were many excellent (and recent) books and articles concerned with the professions and with professional education. Some of these will be cited, as appropriate.

Education for the Professions

Discussion of this topic is necessary because, as Nyre and Reilly note:

> The professions are so inextricably bound up with the status and structure of society--impacting and responding at the same time--that they are highly visible and influential and, therefore, rarely ignored.[4]

This optimism is followed by a statement regarding education where, the authors remind us, the study of professional education has never moved far beyond an obligatory recognition of its existence. Perhaps library education can be seen as falling somewhere between the two extremes.

Three aspects or dilemmas of professional education require brief mention here. The first of these is relationships within the university, especially the need to understand and recognize differences between graduate education and professional education and the need to link the professional schools with the basic disciplines. The latter point is made by Ver Steeg, who argues that this linkage has become more critical as the needs of society have become more complex and sophisticated.[5]

A second important aspect of professional education is the role played by professional associations. Perhaps this is better expressed as conflicting roles or as tensions apparent in relationships between professional associations and universities. These tensions can arise when a professional association seeks self-regulation, in part, through the program accreditation process or seeks to improve the economic status of its members through increased demand for their services and reduced supply of "accredited" graduates. These and other dimensions of standardization of knowledge and market control are carefully delineated by Larson.[6] These issues are discussed by Wallis on the basis of an examination of the extent to which the motives and methods of professional associations are consistent with those of universities.[7] He notes especially the opportunity that professional school faculty may have to use the accreditation process to pressure the university for things that they are not able to obtain through the normal intra-university mechanisms.

A third current concern of professional education is that of specialization, particularly with respect to technology. This is not a new topic. Almost ten years ago, Mayhew urged that professional school curricula be organized so as to provide time for specialization and time to find relationships with other specialties.[8] He also recognized the need for generalists. Mayhew called attention both to the uses of technology in instruction and to the need for professional students to learn of substantive issues resulting from the societal uses and impacts of technology. The matter of joint degrees, the insistence of some employers on the need for a second Master's degree, and the need for the curriculum to include discussion of ethics and values (e.g., the impact of technology or technical decisions on individuals and on society) are other specialization-related topics of concern to those responsible for professional education.

Reforms and Research in Professional Education

There is no lack of literature suggesting the need for movement away from the traditional approach to professional education. A conference report from Canada provides some excellent papers that include possible alternate approaches. Slayton sees the need to begin a research agenda "intended to facilitate sound evaluation of existing professional education programs and detailed development of alternatives."[9] He suggests multiple levels of education and the corresponding multiple curricula, the idea being that "individual professionals should be educated only to the point necessary for them to provide the service that is their responsibility within the structure." His curricula would then differ in rigor and comprehensiveness and in the extent to which they are interdisciplinary and service oriented. Slayton indicates that much empirical work is needed to develop a model of professional education objectives.

Nyre and Reilly also see the need to devote more time to research- and action-oriented endeavors and less time in "debate" of the issues. They organize needs for development into two categories: (1) the integration of theory and practice and (2) integration and collaboration between and among professions, professional schools, and private and governmental agencies.[10] Their specific concerns, including admissions practices, curriculum, and continuing education, will be reflected elsewhere in this paper.

Library educators have not avoided professional education issues totally, although most who address the issues do so at level of specificity that ignores the richness of the available material. Wasserman is an exception. He recognizes that the intellectual base in many disciplines is found in professional schools and that, for librarianship, there is an urgent need to revise the educational design if that intellectual base is to be realized.[11] Wasserman suggests three types of modification necessary to alter the educational experience. These are: experimentation based upon a change in assumptions about the nature of professional practice, change derived from a commitment to the changing nature of the technological capacity of the institution in which the professional practitioner is to be employed, and changes that reflect activities in interinstitutional sharing. The latter requires educational structures that may involve more than one educational institution and more than one curriculum.

Probably the most recent and the best known study of research needs in library education is that compiled by Borko. Through the mechanism of ten invited papers, this work reflects the concerns of the early 1970s and provides a general historical overview. Borko's contribution was to evaluate and to prioritize some 36 proposed research ideas using the Delphi method. Highest priority topics were those relating to the educational problems of librarians after graduation and those concerned with improving the quality and relevance of the graduate library school. This latter category of concern is still with us and is the topic to which the remainder of this paper is directed.

Research Directions for Library Education

The research needs framework is facilitated by a number of logical analyses of professionalism presented by Larson.[13] For example, we can certainly agree that professions are the occupational roles that closely tie educational credentials to occupational function and that this may conflict with the principle that a profession's dependence on formal institutions of training enhances the role of educators who are increasingly (in some professions, at least) identified with the theoretical rather than the practical side of the profession. Educators are the first to screen and, possibly, influence new talent entering the profession including new talent who will become professional educators. In the sense that they do have more control over training institutions than practitioners do, educators are more likely to be recognized as spokespersons for the profession. Larson's book deals with many of these complex issues. The basic point for our consideration is that a clearly defined basis of training is important for the unification of a profession and is the main support of a professional subculture. For librarianship, its educational component is not presently an adequate focal point for the profession.

To propose and discuss a research framework, it is necessary to identify the essential elements or components of library education. Somewhat arbitrarily, I have chosen five such elements: students, faculty, curriculum, relationships with the university/professional community, and practice. Similarly, there are two unifying issues that affect some or all of these components. These are technology (access, delivery systems, curriculum content) and costs (including marketing costs). Figure 1 displays the components of library education, subtopics in need of study, and the unifying issues.

It is convenient to discuss research needs on a component-by-component basis, highlighting some research areas for which a literature base exists and suggesting others which seem especially useful for librarianship. The assignment of research ideas to a particular component is somewhat arbitrary. Readers will want to place other topics within the matrix or to cluster their ideas in some of the other possible arrangements.

Components of Library Education	Organizational and Structural Concerns	Unifying Issues	Evaluation and Effectiveness Concerns
Students	Admissions/Recruiting	Costs Technology	• Competencies • Socialization
Faculty	• Part-Time Faculty • Joint Appointments • Demography		Faculty Development
Curriculum	• Duration of Study • Degrees • Core Curriculum • Fieldwork/OJT		Learning
Relationships with University and Professional Community	• Joint Degree Programs • Link with Basic Disciplines • Manpower Planning		Accreditation
Practice	• Use of Paraprofessionals • Specialization • Provider-Consumer Relations • Networking		• Ethics • Competence • Licensure-Certification • Continuing Education

Figure 1. Research Needs Framework

Students. Three topics of concern are prime targets for increased attention. These relate to admissions, competencies, and socialization. Admissions is the key issue; perhaps if we knew more about this, the rest of our problems would disappear. Any approach to admissions must take into account the greater diversity of applicants, change in the number of applicants, and the need to use both objective and subjective measures to assess the qualifications of applicants. In many library schools, recruiting is not a well-understood activity, in part because of uncertainties as to what kinds of applicants to seek. Compounding the problem is the current trend toward changing the names of library schools to reflect interest in information and/or management. How quickly faculty and services curriculum change to match a school's name is not known.

Goolsby[14] points out some of the potential dangers in having rigid admissions requirements that apply equally to all applicants. Use of multiple variables for decision making helps to avoid the difficulties encountered with standardized tests and also provides information useful for placement and advising. One approach might be to supplement an objective measure (e.g., Graduate Record Examination) with one or more subjective criteria. Applicants could be encouraged to submit whatever evidence seems appropriate to them and they could be interviewed. Several authors suggest the increasing utility of interviews in evaluating minority applicants, in assessing understanding of the professional curriculum and environment, etc. Use of an interview protocol and scoring form helps to evaluate the results and use of telephone interviews keeps the costs reasonable.

Review of the requirements for admission to accredited Master's level graduate library schools[15] suggests that a B grade average from any four-year college and the Graduate Record Examination represent the basic admissions policy of most schools. These are not really objective measures--especially for minority, foreign born/educated, or other applicants whose undergraduate degrees are dated five or more years ago. We do not know, in any organized way, how graduate library school admissions requirements differ from those of other professional or graduate schools having similar characteristics. Neither do we know if schools having a particular strength or special emphasis should or do attract students whose abilities or expectations differ from those of the total pool of applicants. And, because we have no way of assessing the competencies of recipients of Master's degrees--either to see if competency has increased during graduate school or to see if admissions criteria are related to success defined as being some specified level of competence.

Perhaps a more realistic and feasible approach to library school input-output problems could be based on mutual expectations; that is, at entry, we would determine and measure (a) what we expect from the student (e.g., grades, experience, ability to communicate) and (b) what the student expects of the school (e.g., certain content, advice, activities) during the period of study leading to a degree. The extent to which both sets of expectations are met would be measured at program conclusion. Discussion and development of these ideas are prerequisite to trial implementation.

Assessing the competencies of library school graduates continues to be a difficult topic. In addressing this issue, Fingerson[16] assigns responsibility both to faculty and to students. Faculty must specify behavioral objectives on a course-by-course basis and present that aggregate of behaviors and attitudes comprising professionalism which can be observed or measured in the classroom prior to graduation. Students can select a plan of study, at least in part, by selecting courses having objectives they wish to achieve. Fingerson raises interesting questions about aspects of a student's work or attitudes that are or are not observable or measurable during coursework and related school activities. This is a rich area for additional study.

A related topic is the socialization of library school students. Although the primary focus is on the training of academic librarians, Clark and Gaughan[17] provide a general discussion of informal mechanisms of socialization (e.g., faculty-student and student-student interactions) that suggests weaknesses in library education. The generalist curriculum, the brevity of MLS programs, the lack of opportunity to attend and participate in professional activities are among the reasons why socialization does not occur. The authors suggest changes in admissions criteria, an expanded time of completion for the Master's degree, a theoretical framework that provides students with "common understanding about what libraries are and what place they have in society," and an increased sense of responsibility for the socialization of library school students by the appropriate professional associations. This issue is researchable and can be developed from the substantial literature base found in sociology.

Faculty. In this component of library education, faculty evaluation and development, the use of part-time faculty, and matters of tenure and collective bargaining continue to be controversial and complex issues.

Conventional studies of these problems would be facilitated if the data routinely collected by the ALA Committee on Accreditation could be made available to researchers in machine-readable format.

More interesting, perhaps, would be examination of the changing uses of part-time faculty. In the past, part-timers were almost always local practitioners who were thought to be useful as role models or because they had specialties that were useful additions to the curriculum when taught once or twice a year or because they were willing to teach at night, on weekends, or at remote sites when senior faculty preferred not to do so. Today, part-time faculty are urgently sought to teach basic library or information science subject matter about which many tenured, full-time academics have minimum knowledge. Information systems technologies and design, communications and educational broadcasting, and public administration/finance are examples of such subject matter. These topics often bring the involvement of part-timers of a different sort--those who may hold joint appointments in two schools or departments. Not much is known about the current uses and effects of part-time faculty, and this topic is suitable for study if a sufficient amount of data is batched from several schools. A related study would determine whether or not full-time teaching faculty perceive that their knowledge of practice is diminishing and/or that the gap between theory and practice is widening. Student perceptions would, of course, also be important, and it could be that the usual complaints about part-timers (e.g., limited access by students) are diminishing as the tradeoff in favor of current knowledge of the field grows more favorable. Similarly, the demand for continuing professional education puts pressure on full-time faculty to be current and to be available on consumer-determined schedules. Faculty development programs may yet become meaningful.

Nyre suggests that higher education institutions generally and professional schools in particular may become more interested in faculty development as they recognize that they should be concerned with ". . . the full range of vocational, intellectual, and personal attitudes and abilities of their graduates beyond just incremental stages of basic skill achievement. . . ."[18] The necessary changes come not from short-term curricular change but from changes in the teaching-learning process. Several topics mentioned earlier in this paper (e.g., faculty-established criteria for student performance) are also related to faculty development. Nyre shows why a range of instructional and organizational problems, needs, and values must be reviewed and concludes:

> It is impossible to separate any of these activities as curricular change, instructional improvement, organizational development, or faculty development per se. They are all of these, and yet the sum is more. Each is an integral part of institutional self-analysis.

One final research possibility comes to mind--organizational demography. This is the use of demographic variables in the analysis of organizations. Pfeffer reviews some of the pertinent literature in his recent paper considering the age and organizational tenure (length of time in the organization) of the work force.[19] He is especially interested in how age affects organizational changes and leadership succession (inside vs. outside), the negative relationship between tenure and interorganizational movement, and the relationships between continuing education and various demograhic variables. Pfeffer concludes that his arguments and the illustrative data that he presents are speculative, reflecting lack of attention thus far to these topics. They seem most appropriate for investigation by professional educators.

Curriculum. Curricular issues range from the philosophical (e.g., do we or should we try to prepare every student for all possible careers?) to the practical (e.g., joint degrees, duration of study). The former is more interesting to discuss and more difficult to study systematically. Both generalists and specialists are valuable, so are practitioners and researchers. More knowledge and information are available; technology and other societal changes require professional attention and tools for problem solving or access. Professions have responded to these facts of life in a variety of ways including increasing the length of study for the first professional degree, recognition and use of paraprofessionals, requirements (real or implied) for additional degrees or for mandatory continuing education, and organization of required courses into a core curriculum in order to make the presentation of essential knowledge/skills more effective and coherent.

Years ago, Mayhew recognized that professional schools--with their main emphasis on formally organized courses which were professor centered, lecture oriented, and textbook dependent--were inadequate because they presumed a common professional career for all graduates.[20] He recommended a new attitude toward the curricula of professional schools--one based on a "psychological rather than a logical structure." Mayhew suggested or implied a different ordering and different proportion of work and study, a reduction in the amount of material held to be essential, students who are better informed about the nature of the field and can therefore make better educational choices, and more cooperation with other parts of the university so that professional school faculties could be reduced in size without reducing the choices available to students.

We still do not have data to suggest which knowledge and skills are best learned in the classroom, which from directed or self-paced learning, and which from on-the-job training or through field work. (With respect to the latter, Mayhew suggests that the relevancy of the formal curriculum, so often thought to be absent, can be achieved through practice.) Today, the use of technology and the various forms of non-traditional learning can bring formal instruction and field-based training much closer together. Another linking mechanism would be to develop a total curriculum based on the problem-solving approach to learning. Problem solving, Mayhew notes, is by its nature interdisciplinary.

It is not easy to define specific research ideas that might lead to near-term changes in our knowledge about curriculum options. What is needed is commitment to this research, especially at library schools offering the doctorate and at universities that already have a research unit (or a departmental focal point) concerned with professional education. A commitment to good documentation is also needed. Perhaps graduate library schools might agree to the concept of a minimum data set--basic data/variables to be compiled by all schools and input to a central file and access point. Individual schools would have the ability to add special items for their own local use. This data set, over time, would encourage research, especially evaluation research and studies of library school graduates, that is needed but not possible without large files. Indeed, much criticism of doctoral research occurs because small amounts of data collected from limited geographical areas are used in analysis. Generalizations from such data often are not convincing.

Relationships with universities and professional associations. Neither of these difficult areas is the exclusive responsibility of library educators; however, they should be more aggressive in confronting the issues and more informed about options available to them. One traditional form of aggression is research and study. Within universities, more work should be done to facilitate joint degree programs (including an integrated Bachelor's-Master's degree) and to link the basic disciplines with all graduate programs. These are resource allocation problems which require new accounting philosophies (accounting for quality and for costs), understanding of academic governance, and great diplomatic ability. Many of the topics discussed earlier (admissions, faculty development, etc.) are also related to this component.

Two of the issues most critical in the relationships between library education and the professional associations are manpower (personnel resource) planning and accreditation. Stager and Meltz discuss the link between manpower planning and educational planning and point out the need to have data concerning the number of graduates who go immediately into the labor force and the geographic areas in which they find work.[21] They acknowledge that there is no good definition of manpower planning or forecasting; some are broad and include continuing education and quality of training factors while others are narrow and concerned only with the numbers of workers available. Forecasting methods have many problems because they may ignore wage rates (which change) and the operation of labor markets, and they require long time horizons which increase the likelihood of social and economic change. Nyre and Reilly also address this topic and cite some of the recent literature.[29]

The library professional associations have not been especially active in dealing with problems of supply and demand. The accrediting unit has repeatedly stated that it cannot refuse to evaluate new programs upon request or reevaluate existing programs according to its advertised procedures and schedules. Perhaps the more basic issue is that we do not know or understand the effects, if any, of oversupply and underqualification of library school graduates. Is recruiting/admissions affected? Are applicants and potential employers affected? Is the traditional belief that oversupply causes the price of professional services to fall and reduces the social status of professional roles applicable to library school graduates? Professional control over markets is an issue about which there is a substantial literature base. Readers are referred to Larson's book and selected bibliography.[23]

Program accreditation as a form of quality control suggests some problems including disagreements between universities and professional schools. Nonaccredited professional programs located in institutionally accredited colleges or universities have difficulty accepting that a relationship between accreditation and quality exists. Similarly, in states having licensure or certification requirements, or, increasingly, mandatory continuing education requirements, there is more concern about the qualifications of the individual at the point in time that he/she enters the state and continues in practice there than there is about the source of the first professional degree.

Accreditation is always a more likely topic of debate rather than action. It is possible that changes in academic traditions, especially the diminishing impact and meaning of tenure, will stimulate new studies of this topic.

Practice. The rate of innovation and change in library practice seems to exceed that in library education. Correspondingly, the real work to be done in library education may not concern the organization and length of the curricula but, rather, the failure to renew the content (and those who teach it) to reflect changes in practice, changes in the real world environment in which libraries are located, and results of research. Another way of looking at this problem is to say that professional educators may be influenced by outdated ideas about the work environment that graduates will encounter. In any case, topics of interest to practitioners should be potential research and discussion topics for library educators.

Some additional topics of inquiry can be proposed. Slayton suggests a focus on consumer interests in professional services.[24] Quality and access are his interests. Access includes consideration of the number of professionals available, their geographical distribution, the range of skills available, the absence of psychological barriers inhibiting the consumer from approaching the professional, and costs. Quality includes consideration of the tradeoffs between quality and price and between quality and access. The increasing interest in continuing education and staff development provides another basis for consumer studies. As Lauffer points out, CE consumers include both individuals and organizations. The model also includes suppliers, competitors, and legitimizing and regulatory groups (e.g., credentialing institutions)--a complex and not well-understood division of labor presently exists.

Consumerism may affect the way that library educators perceive practitioners. There is reason to believe that some professional schools may begin to emphasize continuing education and off-campus learning. Thus, CE may be a recruiting and public relations device but it may also serve to promote cooperative efforts, the use of more varied instructional formats, and the communication and field testing of new ideas. It will be left to practitioner-consumers to use their buying power to influence CE suppliers.

Tuohyh and Wolfson suggest that we should avoid academic definitions of professionalism because the term has come to have a different focus within each discipline.[26] Instead, they want to define professionalism in terms of the relationship between the consumers and providers of a service. It is during this relationship that specialized knowledge is applied on behalf of a client. It could be that the effects of technology on a (formerly) labor-intensive profession and the increasing need for individualized services will revive questions about whether librarians have or seek client relationships. Concern with ethics and values is part of this question, and the implications for library education are obvious.

Access is a related issue. One of the more interesting questions is whether competitiveness in the library service market would promote access by reducing nonprice barriers (social distance, service hours, etc.) for library users.

The issue of specialization is also both interesting and complex. It can be a positive force, suggesting the creation of a new field or subfield or increasing the opportunities for additional categories of labor (e.g., paraprofessionals) within the parameters of the traditionally defined field. Specialization can also mean overtraining which can reduce mobility by tying an individual to a particular employer or a type of work for which there are a limited number of positions available. Specialization can lead to work that becomes routinized and which could be delegated to nonprofessionals. In general, there is the possibility that specialized knowledge could or might mean knowledge that is "fragmentary and rapidly exhausted."[27]

Other potential research areas include the use of nonprofessionals in library organizations, networking, ethics, continuing education, etc. There is no lack of topics for study and almost any aspect of library practice will suggest questions or problems that are researchable.

The Unifying Issues--Technologies and Costs

This paper has arbitrarily defined five major components of library education and, equally arbitrarily, identified research needs that might fall within each of the components. Effort has been made to show that the basic issues are interrelated. For example:

> Admissions criteria attract students having certain expectations of faculty and about the professional careers available. Curriculum appropriate to these students and to their career expectations must be available. But, admissions criteria must parallel those of other graduate programs in the university and may be influenced by manpower forecasts made by professional associations. Library practitioners suggest competencies and this influences admissions criteria, faculty, curriculum, etc.

Also interrelated are some of the universal goals of library education and library practice. These goals include increased productivity and efficiency, improved quality and diversity, better access, and resource sharing. One can argue that progress toward these goals can be made through better understanding and uses of technologies and costs/market factors. Figure 2 illustrates the proposed equation.

It is not appropriate in the present paper to fully develop the interesting relationships between technologies and costs or market factors and then to describe how every component of library education is affected by these relationships. It is appropriate to suggest that a research framework can be developed if "technologies" are perceived as including consideration of access, delivery systems, subject content for the curriculum, and instructional formats. Similarly, "costs and market factors" suggests study of the market for professional services, entrepreneurial behavior, competition, pricing, and the like. Applications of technologies can result in cost savings (e.g., transportation costs, energy costs) or in the availability of new or added services to the same or a larger number of users without an increase in costs. The number of ideas and the ways of clustering ideas to form research agendas are unlimited.

Conclusion

There is a wide range of topics suitable for research that would benefit library education and a rich body of literature in sociology, economics, and administration that will provide a conceptual base and stimulate discussion. Library educators interested in research must find their colleagues in other parts of the university and/or work with library-oriented researchers at several library schools or with practitioners having research interests. Library schools having doctoral programs or participating in university-wide interdisciplinary doctoral programs should assume a larger responsibility for directing their students into research areas relating to professional education. No support from funding sources or from the profession generally can be expected until this initiative is taken.

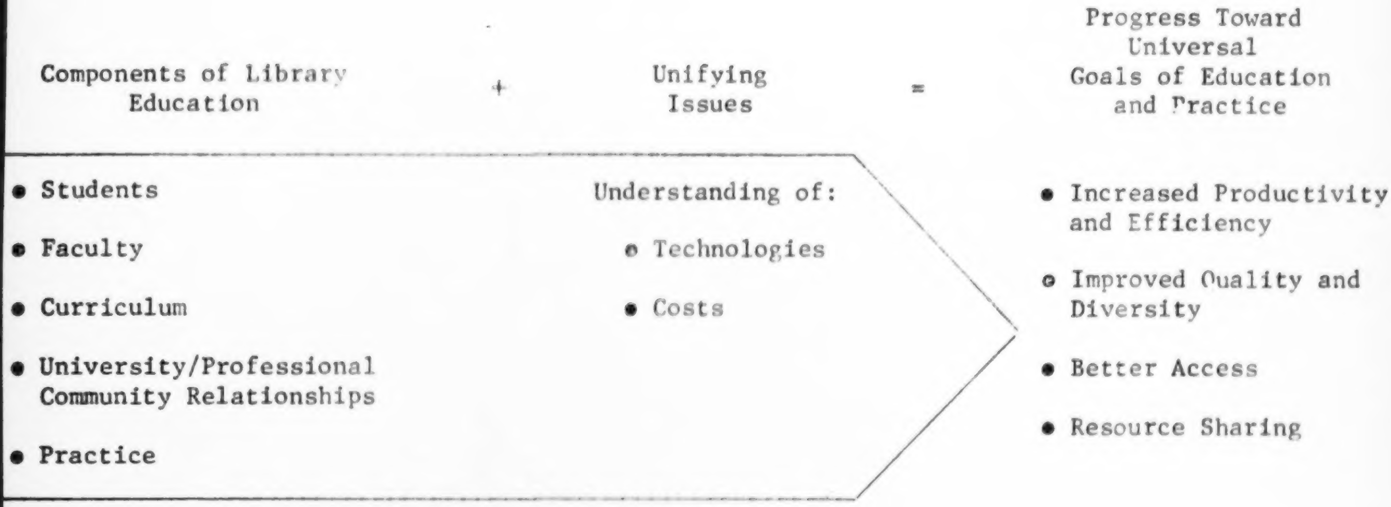
Components of Library Education
+
Unifying Issues
=
Progress Toward Universal Goals of Education and Practice
• Students
• Faculty
• Curriculum
• University/Professional Community Relationships
• Practice
Understanding of:
• Technologies
• Costs
• Increased Productivity and Efficiency
• Improved Quality and Diversity
• Better Access
• Resource Sharing

Figure 2. Equation for Progress Toward Profession-Wide Goals

REFERENCES CITED

1. Katz, Ruth Margaret. "Library Education and Library Research: An Analysis of Institutional and Organizational Context." Ph.D. Dissertation. Rutgers University, 1975.

2. Wilson, Pauline. "Barriers to Research in Library Schools: A Framework for Analysis." Journal of Education for Librarianship, 17 (Summer 1976): pp. 3-19.

3. Wilson, Pauline. "Factors Affecting Research Productivity." Journal of Education for Librarianship, 20 (Summer 1979): pp. 3-24.

4. Nyre, Glenn F. and Kathryn C. Reilly. Professional Education in the Eighties: Challenges and Responses. AAHE-ERIC/Higher Education Research Report No. 8. (Washington, DC: American Association for Higher Education, 1979), p. 1.

5. Ver Steeg, Charles L. "Crossfire in Professional Education: Students, the Professions and Society," in Proceedings of a Conference at Northwestern University, October 1975, edited by Bruno A. Boley. (New York: Pergamon, 1977), pp. 58-59.

6. Larson, Magali Sarfatti. The Rise of Professionalism: A Sociological Analysis. (Berkeley: University of California Press [1979]), pp. 40-52.

7. Wallis, W. Allen. "Crossfire in Professional Education: Students, the Professions and Society," in Proceedings of a Conference at Northwestern University, October 1975, edited by Bruno A. Boley. (New York: Pergamon, 1977), pp. 34-36.

8. Mayhew, Lewis B. Changing Practices in Education for the Professions. SREB Research Monograph 17. (Atlanta: Southern Regional Education Board, 1971), pp. 12-13.

9. Slayton, Philip. "Professional Education and the Consumer Interest: A Framework for Inquiry," in The Professions and Public Policy, edited by Philip Slayton and Michael J. Trebilcock. Proceedings of a Conference at the University of Toronto. October 1976. (Toronto: University of Toronto Press, 1978), pp. 130-141.

10. Nyre, Glenn F. and Kathryn C. Reilly, op. cit., p. 2.

11. Wasserman, Paul. The New Librarianship: A Challenge for Change. (New York: Bowker, 1972), pp. 129, 220.

12. Borko, Harold (ed.). Targets for Research in Library Education. (Chicago: American Library Association, 1973).

13. Larson, Magali Sarfatti. Op. cit., pp. 44-45, 51.

14. Goolsby, Thomas M. Jr. "The Use of Tests for Selection and Other Purposes in the Professions." Paper presented at the Annual Meeting of the Georgia Personnel and Guidance Association. January 1974, 6 pp. ERIC document no. ED 087 800.

15. American Library Association, Standing Committee on Library Education. Requirements in Addition to the Bachelor's Degree for Admission to Master's Level Graduate Library School Programs Accredited by the American Library Association. Revised. (Chicago: American Library Association, 1979.)

16. Fingerson, Ronald L. "Competencies to be Demonstrated." Journal of Education for Librarianship, 18 (Summer 1977): pp. 35-40.

17. Clark, Barton M. and Thomas M. Gaughan. "Socialization of Library School Students: A Framework for Analysis of a Current Problem." Journal of Education for Librarianship, 19 (Spring 1979): pp. 283-293.

18. Nyre, Glenn F. "A View from the Top Looking Sideways: Professional Schools and Professional Development." Paper presented at the POD Network Faculty Development Conference. Airlie, Virginia, October 1976, 15 pp. ERIC document no. ED 144-443.

19. Pfeffer, Jeffrey. "Some Consequences of Organizational Demography: Potential Impacts of an Aging Work Force on Formal Organizations." Paper prepared for the Committee on Aging, National Research Council, National Academy of Sciences, March 1979, 50 pp. (Author's address--School of Business Administration, University of California, Berkeley.)

20. Mayhew, Lewis B. Op. cit., pp. 14-16.

21. Stager, David and Noah Meltz. "Manpower Planning in the Professions," in The Professions and Public Policy, edited by Philip Slayton and Michael J. Trebilcock. Proceedings of a Conference at the University of Toronto. October 1976. (Toronto: University of Toronto Press, 1978), pp. 165-176.

22. Nyre, Glenn F. and Kathryn C. Reilly. Op. cit., pp. 22-29.

23. Larson, Magali Sarfatti. Op. cit.

24. Slayton, Philip. Op. cit., pp. 133-36.

25. Lauffer, Armand. The Practice of Continuing Education in the Human Services. (New York: McGraw-Hill, 1977), pp. 88-92.

26. Tuohy, Carolyn J. and Alan D. Wolfson. "Self-Regulation: Who Qualifies?" in The Professions and Public Policy, edited by Philip Slayton and Michael J. Trebilcock. Proceedings of a Conference at the University of Toronto. October 1976. (Toronto: University of Toronto Press, 1978), pp. 112-113.

27. Larson, Magali Sarfatti. Op. cit., pp. 230-232.

Education for Information Science

Allen Kent

My assigned task was to comment on the broad topic: "New sciences, technologies, and media--impact on education for librarianship (or libraries)." It may be no surprise that my choice of emphasis from this wide spectrum is "information science." And rather than attempting to cover the waterfront in this paper, I am limiting myself still further, by emphasizing some aspects of the "interface" between librarianship and information science, where I believe the action is going to develop in the coming years.

The letters and announcements regarding openings for information science faculty that I see from library schools in the United States and abroad make it clear that the topic, discipline, or interdiscipline, if you will, has come of age in the academic marketplace. The "specifications" for openings vary widely, however, so much so that it is obvious that there are startling differences in the way that "information science" is perceived in different environments. At one end of the spectrum are those who consider "information as a phenomenon worthy of study in its own right"; at the other end are those who want someone capable of teaching the use of the OCLC terminal, for example, as part of the basic cataloging course. In between are those who wish the prospective faculty member to address computer programming, library automation, systems analysis, statistics, networking, simulation, and/or communications (tele- or otherwise).

The announcements and letters also reveal another dimension--regarding the extent of change in curriculum. On the one hand, are those who, for the first time, are venturing "outside" of librarianship as conventionally

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defined, and wish only to have a single "survey" course taught in "information science," with the candidate required to "double in brass," so to speak, by teaching one or more of the usual core subjects such as administration, resources, reference, or technical services. Then there are some who wish to have the new faculty member, alone, to teach a set of "information science" courses. Finally there are those who plunged into the field earlier and now wish to add depth and breadth through their new faculty acquisition.

One can classify these curricula as:

(1) Committed to established librarianship--wishing only to exhibit that they are "with it" by having a single item (course) in the catalog as "proof."

(2) Committed to established librarianship--but worried they may be left behind, and wishing to "test the water" by an initial commitment to a full faculty slot.

(3) Committed to one or more aspects of information science--desiring to develop greater strength.

(4) Committed to teaching and scholarly research at a fundamental level--examining the basic character of the information transfer (communication) process in libraries and other information exchange environments.

Graduates of the various programs exhibit in skills and knowledge the level of commitment of the schools in which they have received their training, leading to some difficulties when they attempt to find their way in the job marketplace.

It appears useful therefore to attempt to structure, or describe, the programs in terms of "exit competencies" which the various programs may have as objectives for their graduates. These competencies fall into three broad classifications:

(1) Literacy

(2) Operational functionality

(3) Research functionality

(1) Literacy

Three categories are suggested under "literacy": word recognition; taxonomy; and fundamental processes.

(a) Word recognition: this is the minimal level, at which words and terms may be recognized and defined, but not necessarily with a full appreciation of their significance.

(b) Taxonomy: this is the level at which the words and terms are understood with regard to interrelationships among them as well as to established librarianship; at this level the component activities comprising information science may be sensed.

(c) Fundamental processes: this is the level at which concepts, principles, processes, and component disciplines become clear, leading to the ability to read some of the literature with comprehension.

(2) Operational Functionality

Again, three categories are suggested for "operational functionality": operation; analysis; and design.

(a) Operation: this is the level at which participation in the operation of an ongoing information system becomes possible, with ability to perform one or more of the functions or unit operations of the system.

(b) Analysis: at this level it is possible to employ existing criteria and measures for evaluating the performance of systems with regard to individual functions or unit operations.

(c) Design: this is the level at which interrelationships among individual functions or unit operations are understood, particularly with regard to the effects that can be produced with alternative arrangements.

(3) Research Functionality

Here again, there are three categories for "research functionality": evaluation; quantitative approaches; and research methodology.

(a) Evaluation: at this level it becomes possible to develop tests and measures for evaluation of systems, their components (particularly the human component), and their interrelationships. Also involved is the ability to establish feedback mechanisms and to analyze and interpret the results of feedback, leading to the establishment of new procedures and processes which will lead to predictable outcomes.

(b) Quantitative approaches: this is the level at which precise and sensitive understanding of measures becomes possible, with appropriate instruments able to be designed.

(c) Research methodology: at this level there is an understanding of the full range of research methods and of problem analysis, with the ability to select the appropriate method(s) for a given problem that is to be addressed, and the development of a testable hypothesis. Also involved is the ability to analyze and interpret data, and to relate the results to the support of the hypothesis.

Given these levels of "exit competencies" which are developed here, these are some of the questions that are frequently asked by concerned library science students and faculty. Most of these questions exhibit a feeling that the computer is the dominant factor in "information science":

1. Do I really need to know how to program a computer?
2. How much mathematics do I need, to be able to program a computer?
3. Is "information science" content best taught in separate courses, or related to conventional library science courses?
4. How much "hands-on" experience with computers is really needed?

While questions such as these are not necessarily the ones the information scientist might consider the most appropriate, they are symptomatic of some issues that are important.

It is frequently stated that one does not need to understand the principles of the internal combustion engine in order to be a skillful operator of an automobile. When this statement is made in the context of information science education for librarians, I infer that it means:

1. I do not wish to understand the principles of computing, only how the computer may be employed to solve library problems.
2. I, myself, do not wish to program a computer; rather I wish to employ specialists who would perform that task.

Many of today's graduates of library schools will probably be able to conclude a full professional career without ever being obliged to write a computer program. But few will escape the impact of computers in the libraries in which they will work. This does not mean that every library will have its own computer, although some will assert that mini-computers (as prices keep diminishing) will find their way into a large percentage of libraries. Rather it means that the computer will be a factor in budgeting, accounting, shared cataloging, etc., at least through a library system, consortium or network. The librarian who does not understand computer principles will be obliged to accept as appropriate whatever is provided, without the ability to offer meaningful feedback for change or adjustment.

Returning to the analogy of the automobile, we are all well aware of the ways in which accidents occur, inefficient performance goes unnoticed, and inappropriate and costly repairs are made--frequently as a result of the lack of even minimal knowledge on the part of the owner/driver. Similarly with computers, the library which is impacted by the computer may not be well served (particularly regarding "human values") unless the professional librarians have some understanding of its principles. Perhaps one should use the term "computer literacy" to describe the level of understanding that should be a minimum.

It is difficult for most to comprehend computer principles without having some personal involvement with computer programming. So I would see considerable benefit from such involvement. The typical introductory courses offered by computer science departments are not usually effective in this regard, often serving to confuse and frustrate rather than to be helpful. So it is frequently necessary to develop a specially designed course (or courses) for this purpose, with exercises and applications relevant to library science.

Exposure to principles is important as well when computer specialists are employed by the librarian, or computer or systems salesmen are encountered. The establishment of specifications of what is to be accomplished and the evaluation of the product require more than a "sixth sense" on the part of the supervisor, since otherwise there may be misunderstandings, or worse. Unrealistic or unrealized objectives may be avoided, and realizable opportunities otherwise neglected may be addressed.

There is a common fear with regard to the requirement for a mathematics background. While such a background is generally useful and wholesome, it is possible to provide painless (mathematics-free) instruction in computer principles and even programming. The "bedside" manner of the instructor becomes critical here: one may find it useful to introduce logical principles and the theory of sets without "telegraphing" what is being done--naming what has been done only after the fact, when learning has been accomplished and it is obvious to the student that it is not so hard after all.

There are some aspects of the field that benefit greatly from "hands-on" experience. The Information Bank of the New York Times; the ERIC data bases; as well as other computerized data bases (e.g., OCLC): these services are impacting libraries more and more. Many "data bases" are becoming increasingly available in non-library environments through commercial services such as Lockheed and SDC. It is hard to be a reference librarian without knowledge of these services--particularly when the patron knows how to utilize them and the librarian does not. Hands-on experience in phrasing questions seems to be a necessary part of the armament of most librarians, but also a fundamental understanding of the principles, lest vendors sell a bill of goods, or promise unrealistic results in the heat of competitive marketing.

I once felt that training in this field should only be provided in separate coursework. Today I am not so sure, since an integrated experience in cataloging (cum OCLC), reference (cum data bases) can provide a better learning environment for many students. A problem arises when the teacher of the conventional course may not be sufficiently au courant to handle the instruction effectively, or may be too threatened to permit a specialist to intrude in the classroom to provide for team teaching. Worst of all is when the teacher prefers to neglect the augmentation.

We can now leave the computer area per se and introduce two other "subjects" that are considered by some to be "information science": (1) quantitative methods, and (2) systems analysis.

(1) Quantitative Methods: Just as librarians are expected to be literate, so are they expected today to be "numerate." The need to be guided by past performance, the attention to evaluation, the increasing pressure to plan and relate to budget dilemmas; all these suggest that an understanding of probability and statistics should be a part of the armament of librarians. Just as with courses in computer programming, these courses are frequently better taught with special attention to library-related problems, lest the bridge between theory and practice be neglected.

(2) Systems Analysis: The analysis (and design of systems) benefits from a formal experience. At the risk of sounding prescriptive, this instruction should not be limited to "flow charting" as is done in some schools, but rather should require exposure to the entire range of theory--including the behavioral aspects, involving an understanding of how to deal with human resistance to change when new systems are to be initiated. Some like this subject to be taught in connection with "administration" where there is an obvious relationship. Others prefer to interface it to computer-related subjects.

Moving from the area of coursework, there are several core areas of research in which information science tools are being applied to library problems.

1. Resource Sharing and Simulation

The ability for a group of heterogeneous libraries to share resources is considered by many to be conceptually appealing, theoretically sound, and technically possible. The unanswered questions are: (1) Will it work in an operational environment? (2) Is it economically feasible? (3) What effect will it have on the policies, practices, and services of the participating libraries? and (4) What is the optimum size and composition of a library network to effectively share resources? In an attempt to investigate these unanswered questions, the University of Pittsburgh embarked upon the design of an experimental regional resource sharing library network with six participating institutional libraries who have agreed to join the network (financed by a grant from the Buhl Foundation). The libraries in these institutions differ radically in terms of staff size, patron population, size of holdings, acquisition policies and practices, budgets, and many other characteristics.

This library network is being designed and will be tested in an operational environment with each of the members utilizing a network computer facility for acquisitions, cataloging, interlibrary loans, management information, union list of holdings, and accounting data. In addition, the network is to serve patrons for searching a union catalog for purposes of identifying items that exist in the network and to facilitate interlibrary loans. One of the principal design parameters was to include all the major library functions and to determine the interrelationships between the various functions and the effect of these relationships on the functioning of the network.

The most difficult problem in attempting to design such a library network is that there are many variables related in an unknown manner. Before attempting to formulate a design of the network, it was necessary to understand how these variables would affect the operation of the network under varying conditions so that economic and technical costs and benefits could be assessed. In addition, it was felt that the participating members might be able to utilize this data in formulating policies and procedures in utilizing the network.

A computer simulation has been constructed in connection with our network program, which accepts user defined inputs, generates values based upon representative mathematical distributions; processes these values according to the logical/mathematical model; and produces outputs that represent the behavior of the system under the conditions established by the values assigned to the variables. To simulate a variety of conditions or alternatives, it is only necessary to vary the inputs representing the desired conditions. The outputs represent how the system behaved under the established conditions. The outputs are then analyzed to determine how the changed conditions affected the behavior of the system.

2. Cost-Benefit Model of Library Operations in Terms of Use

I have a personal bias, which I should state at the start. My only criterion for judging the effectiveness of an acquisitions program is the use of the materials acquired. It is obvious to me that it is "wrong" to purchase an item that is never used. But it is not possible to make that judgment decisively because all one can assert is that an item has not been used until now. The question that remains open is whether a use yet to be made may or may not be of sufficient importance to have justified its purchase.

At the time an item becomes available for purchase, one cannot predict with certainty how frequently, if ever, it will be used. Nevertheless, judgments are made, in the real world, because there is never enough money to buy everything. So the question to be raised is: Did a judgment to buy result in use--until now?

An investigation of use of books and monographs suggests the possibility that a significant percentage of acquisitions is used very little or not at all. It also suggests which materials might not have been purchased, which might have better been purchased cooperatively (in a resource sharing environment), and which are good candidates for weeding.

Lest you believe from these comments that I believe information science is bounded by computers on the north, statistics on the south, and has not east or west--I would assert that the field must be undergirded with behavior studies--in a major thrust we seek to investigate human behavior in the information seeking mode.

I have reported on several research activities to illustrate how a few aspects of "information science" are being applied to practical library problems. Simulation, modeling, and statistics are being used as important tools in connection with library network design, resource sharing decisions, and even book selection. Scientific method is beginning to remove some of the "art" in making the difficult decisions in libraries.

It appears to me that it is unfair to our students to permit them to leave our programs without these tools, which I am confident they will need to survive professionally. As a minimal statement, I believe that they will not have the opportunity to become leaders in the profession unless we arm them with the "tools of the trade," so to speak.

In connection with the preparation of this article, I read the most generally assigned texts for "core" courses in library science. In the main, these texts do not reveal fundamental changes, to reflect the considerable changes of the last decade or so. The information science aspects, where they are covered at all, are "pasted on"--without development of the "interface."

For example, I mentioned earlier the research on use, and the resource sharing network--I know this must have an influence on acquisition policy and practice--and yet the current texts do not make this clear.

Am I alone in this thinking?

A Student's Perspective on Information Science Education

Eileen Trauth

When considering education in information science, it would seem necessary to maintain a consistent understanding of the meaning of information science. This understanding, then, serves as a focal point from which to view issues at hand. One of my earliest conclusions as a student in the field, however, was that there seemed to be as many definitions of information science as there were people teaching and writing on the subject. While some definitions were approximately the same, others were radically different. A sampling of the definitions is the following:[1]

> *The study of the fundamental principles underlying* the structure and use of *information*.
>
> Information science is an aggregation of disciplines that promise to provide a modeling and application of *information processing* structures.
>
> Information science is fundamental to technological imperatives of *information storage and retrieval*.
>
> The objective of information science is the development and application of a general set of techniques and devices for *problem solving*.

The diversity of perspectives regarding the field is apparent in educational settings within which the subject is studied. Information science is usually studied in conjunction with library science, computer science, or business.

By piecing together these definitions, a few distinct views of information science emerge. One view of information science is that it is essentially the study of automated information storage and retrieval systems. As such, it is corollary to and supportive of another primary activity. An example of this view would be that held by many library scientists. According to this view, information science deals essentially with the computer-based techniques associated with a particular information activity--information storage and retrieval. Another setting in which this view is held is business. While the context of the storage and retrieval systems may be different, the same activity remains as the essence of information science to many in the business community. Indeed, the term "information system" is often considered synonymous with "information science." The additional component of business' attitude toward information science derives from the increasing popularity of management information systems. With this has come the trend toward viewing information systems as more than entities for storage and retrieval only. They are coming to take on the additional role of enhancing the decision-making process through the provision of relevant information to management.

This view of processing data so as to provide management information leads to a second view of information science. This perspective focuses almost exclusively on the automated processing dimension. Here, information science is considered to be generally indistinguishable from computer science. Thus, information science means the study of computers and associated techniques used for processing information.

It can be concluded, then, that a great majority of "information scientists" are acting out of a view that their field has no real existence in and of itself. Rather than being a distinct discipline, it is seen as another name for or is a part of an already existing field of study. Both perspectives on information science are a bit too narrow for me. The view that I hold would distinguish the use of information in other fields from the essence of the field itself. In this view, information science is, at its simplest, the study of information. All interactions within the field derive from this essential premise. Fundamental to this view is the acceptance of the notion of information having existence as a scientific phenomenon. Thus, one could study information in much the same way as one studies energy, or sodium, or basket weaving.

Information science, then, is a discipline which studies the concerns generated by the existence of the phenomenon of information. Some of the concerns are technological; others are behavioral. Thus, the spectrum of study goes from systems design and programming to human information processing and the social impact of information.

What characterizes all these areas of study is an "information perspective." This perspective involves consideration of the phenomenon as being distinct from media storage, processing, or transmission. Since the focus is on the phenomenon and not the medium, a broader perspective is possible. This information perspective, for example, enables the information scientist in a design situation to have command over a variety of media and choose the one that best suits the situation--whether it be a book, a computer, or a file folder. An additional aspect of this perspective is its behavioral component. Since the various media involved with information are seen as being only the tools, the focal point becomes the user and/or the ones affected by these tools.

This view of information science allows for a greater variety of information activities than those allowed by the first view. It expands the second view by applying a behavioral component to the study of computers. It is this third view of information science that will be used in presenting the following perspective on an information science education.

One thing became apparent to me as I studied information science and later when I began to teach courses was that the field's diversity required different treatments of the subject matter, depending upon the make-up of the students to whom the course was offered. Thus, I consider a unilateral "Introduction to Information Science" course virtually impossible to implement. The reason for this opinion derives from the belief that one's "introduction" to any discipline is best accomplished if it is aligned closely with one's currently held knowledge, beliefs, and attitudes. This difference in approach to teaching information science does not, however, change or narrow what information science _is_; it merely provides an area of interface, a way of linking up new information with existing knowledge.

In general, learning about information science could be broken into two distinct categories: 1) learning the theories; and 2) learning the practical aspects. While for purposes of intellectual exchange this division into two clearcut categories can be made, in the educational setting there should be a natural integration of the two.

The theoretical dimensions of information science can be taught at all educational levels--from high school through doctoral studies. That is to say, information as a scientific phenomenon can be studied with varying degrees of depth. At the high school and early undergraduate levels, the role of information in our daily lives can be considered. Additionally, the changes in society resulting from the changes in the way we perceive, create, and use information can be followed. This introduction to information science as a field of study is consistent with the introductions to the many other fields that constitute a liberal arts education.

As one moves up the educational ladder into upper level undergraduate and Masters level coursework, the study of information can assume more depth. Here the interdisciplinary aspect of the field comes into play. Further probing into the specific ways in which either individuals interact with information or information affects groups of people is probed. Also, the idiosyncratic properties of data are considered as well as the development of better ways to organize, process, and disseminate information based upon them.

The doctoral level information science courses, being the most theoretical, would deal with the properties and principles of information and the associated activities. This level of study is concerned with bringing the phenomenon of information into sharper conceptual focus so that the field can advance in a more codified fashion.

Thus far, this consideration of the theoretical dimensions of information science as they relate to teaching has made no mention of whether students would be taking these courses as a primary field of study or as electives to fulfill distribution requirements. I don't think it matters. I see the need for information science courses offered at all these levels for both majors and nonmajors. As such, information science can be viewed as an addition to the list of subjects with which one ought to become familiar if one is to be a "generally educated" person. The degree to which one needs to become familiar leads to a consideration of the differences between an information science education for majors and nonmajors.

The aspects of information science relevant to practical application would be of interest to both majors and nonmajors alike. Nonmajors can further be divided. There are those who would learn computer programming, for example, if only because it is a valuable skill to have. They might not be intending any particular involvement in the field of information science. The other category of nonmajors, however, would remain closely affiliated with the field. In this category I would place library and business students. For these sorts of people, information science may become a cognate area of study. It would prepare librarians, for example, to become facile in the design and operation of on-line bibliographic retrieval systems. It would enable people in business to design and operate management information systems. Information science studied at this level and from this perspective would focus on the tools required to manipulate, organize, store, retrieve, and disseminate information. If one adds this applications orientation to the theoretical considerations outlined earlier, then an information science education at any level and for any intent emerges with a grounding in the human and the technological, along with the theoretical and pragmatic.

Finally, information science majors would study the theoretical and applications aspects of information science with an eye towards generalizing this knowledge. This enables the extraction of principles of systems design and implementation, and information processing, use and dissemination for application in specific areas.

Because of the difference in focus between information science majors and nonmajors whose cognate area is information science, there is the opportunity for a mutually beneficial collaboration. What one lacks, the other should be able to provide for. Take the area of library science, for example. In principle, information scientists should be competent in the design of any sorts of information systems. In fact, it would be nearly impossible to be completely proficient in all areas. If the design in question is of a bibliographic storage and retrieval system, then the expertise of the library scientist can provide the added applications understanding required in order to develop a viable system. On the other hand, suppose a large library already has a computer-based storage and retrieval system. Suppose that it would now like to expand its use of the computer to accommodate the managerial aspects of running the library. The sorts of information systems required might be beyond the scope of those studied in the library science curriculum whose focus was limited to storage and retrieval of bibliographic material. Here, the information scientist might contribute his/her knowledge and skills. As the subject matter incorporated into the field of information science continues to grow, the specialization of curricula by level, depth and focus will also continue. As long as there remains mutual respect and a spirit of cooperation among those involved with the field, this situation can lead to quite beneficial results.

Given the view of information science that was presented at the outset of this paper, consistency requires that certain notions be incorporated into the courses, no matter what the educational setting in which information science is studied.

First, since information is viewed as a scientific entity, its origins and properties must be probed. The extent to which this is done depends upon the reason for studying information science. Included in this notion would be attention given to the difference between data and information (with data being presumably where information is derived). To a librarian this difference would be considered in terms of the methods for the retrieval of data that would result in the desired information. An example of this attention exists currently in the debate surrounding the relevance of retrieved documents. Various methods have been proposed and refuted for the measurement of statistical relevance, or how often retrieved documents are considered to be relevant. That is, there has been an attempt to measure the relationship between specific data and the information expected. On the other hand, there are those who see the relevance issue as an individual phenomenon only: does an individual user judge an individual document as capable of resulting in the needed information? Regardless of the viewpoint on relevance, the need to understand the implications of the difference between information and data are apparent.

The distinction between data and information is further felt in terms of establishing policies for the control of both. If information is an individual phenomenon, then data--but not information--can be directly managed. The implication is that in the attempt to manage information, close attention must be given to *what* data tend to result in *what* information. The treatment of this notion in an information science education points to the blending of the theoretical with the practical aspects of the field.

The second notion about information science has to do with its technological aspects. Information science differs from computer science and telecommunications in that the technology is of secondary importance. First comes the information, then the physical means by which it is to be manipulated, stored, and conveyed. I believe that an information science curriculum has the responsibility to "demystify" information technology. This is not to say that the technology should be denigrated. Rather, the role of the technology should be placed in the proper perspective. A user-oriented perspective should always be paramount. Further, all information professionals need to be familiar with the technology so as not to be fearful or resentful of it. Finally, information professionals ought to be encouraged to convey this attitude to others. For the librarian this would mean, first, becoming personally proficient in the use of the relevant technology and, second, encouraging library patrons to become so as well. A practical example would be in the use of on-line search services. If librarians have not been adequately trained in their use. then it is safe to assume that the patrons with whom they come in contact will not be encouraged to do so either.

The final notion about information science that must be incorporated into any curriculum is that information science is a means toward achieving a new literacy. Whereas reading and writing were once sufficient to establish and expand one's knowledge base, there is an increasingly important requirement for a new kind of literacy. The explosion in the amount and kind of information available requires new skills in order to remain "literate" in one's chosen area of study. The contribution of the computer and its associated hardware and software provides the means for doing so. With the ability to search databases and find the desired information, a person no longer needs to restrict his/her knowledge base to that which can be retained in the brain. The computer provides a mechanism for "augmented intelligence." Thus, learning about information science enables an individual to switch from the viewpoint of an education as learning to that of learning to learn. The librarian is provided with a means of keeping abreast of current information and can convey this to users who are desirous of doing likewise.

Postscript

The preceding viewpoints on what information science is, how it should be taught, and what the curriculum should contain is largely an outgrowth of my own experiences with information science education--as a student. I have recently switched to the other side of the desk. Having done so has served to reinforce some of the points already made regarding education in information science.

The students that I teach are business-oriented. As such, they fall into the category of students for whom information science is a cognate area. Indeed, there are two information science courses which are requirements for most of the students in the college. One fact that I quickly learned was that while the faculty and administration might see the close relationship between business and information science, the students usually do not. Students having information science as a cognate area are not always willingly in this situation. Even if they choose it as a major or minor, it is not always done with a clear understanding of the connection between their career interests and the essence of information science. Rather, they have vaguely gleaned that computers are somehow important to know about.

I think this is often the case for two reasons. First, the links between their specific application areas and information science have not been strongly enough established. The students need to learn what information science is within the context of the ways in which they will be making use of it. Second, while the context for introducing students to information science might necessarily imply focusing on the technological and applications aspects, students ought to understand that information science as a field of study encompasses much more than the technology. If this notion is not conveyed, then students are learning computer science and not information science. If information science is indeed to be taught, then the educational setting must provide two links. One is between the specific application area and the general body of information science knowledge that is being brought to bear on that application. The other link that must be integrated into the curriculum is between the theoretical dimensions of the field and the practical use of these theories. If these two can be achieved, then I believe students will be truly prepared to utilize the fullness of the field to which they have been exposed.

The implications for the education of librarians, it seems to me, can be considered in like fashion. Library students need to understand why information science is relevant to their studies as much as they need to understand how to use an on-line retrieval system. In order for information science to really enhance their professional training, they need to have the theories and principles of information science incorporated into the courses on the subject. That is, an understanding of "information" as an entity, a user-oriented perspective on technology, and the role of information technology in learning to learn all need to be conveyed to the student of library science. If this can be accomplished, then I believe that information science will be assimilated into the educational experiences as a valuable new dimension rather than being seen as a peripheral skill that is sometimes "tacked on" to one's list of course requirements.

NOTES

[1] Eileen M. Trauth, "A Study of Some of the Terms Relevant to the Field of Information Science," Information Science: The Contemporary Issues, ed. Eileen M. Trauth and Anthony Debons, New York: Marcel Dekker, Inc. (in press).